

PROF. SMYTH'S LECTURES ON MINING—No. XXIX.
[BY OUR SPECIAL REPORTER.]

The next thing we have to consider is the means of getting access to the interior of the mine by means of shafts, a shaft (French, *puits*, or *bure*; German, *Schacht*) being a more or less vertical opening, as compared with a level. Where a definite plan of work can be arranged beforehand, with a prospect of its being carried out, the deciding on the best position for the shaft is a very important matter. In a colliery or working where you can by boring, &c., make out the structure of the ground, there would be no excuse for the engineer not applying his judgment and consideration to the placing of the shaft in the best possible position. But in consequence of the great uncertainty and irregularity about metalliferous repositories, it is impossible at the outset to say where the principal workings will be, and we must accustom ourselves to see one shaft after another which was intended to become the principal shaft abandoned, or used for some subsidiary purpose. It will generally be considered best to have the principal shaft (or the sump shaft, as miners call it, because the greater portion of the water is raised from it) placed nearly in the middle of the sett, so that you may work to one side or the other. Till you get down to from 80 to 150 fms., according to circumstances, you can scarcely look on any one of the shafts as the principal centre of the mine about which you will centre most of your arrangements for surface operations. The best position of the shaft will be regulated by a variety of considerations; it will depend in great measure on the configuration of the surface, and the nature of the ground. Of the various shafts the sump shaft is the deepest; it is sometimes called the engine shaft, the engine being chert for pumping. The shaft for winding will be termed the whim shaft, the whim being the term used for the apparatus for raising; in the shaft it may be necessary to pump as well, either by a separate engine or by horizontal rods from the sump shaft, in the latter case it is termed a flat-rod shaft. Besides these, subsidiary shafts are sunk at intervals of 20, 30, or 40 fms., these being generally termed winzes, and these may be for the purpose of subdividing the ground for the convenience of working, or for ventilation of the levels. These winzes (or sumps as they are sometimes conveniently termed) are analogous to what in colliery workings are called staples, or blind shafts, small shafts between two levels, which are very important in ventilation, and which form a means of escape for the men in case of accident, a matter of no small importance. It is true that mines have often been carried out to a considerable extent with only one shaft, but it is a question how far this should be allowed to go on; most metallic mines commence and work for some time in this condition. In the time of Biddle and Wood working was carried over scores of acres from only one shaft, but since the Hartley accident, where from an interruption in the only shaft all the men perished, it became necessary by Act of Parliament to have two shafts as soon as the mine has advanced to a certain distance. The German mining terms for the different shafts are corresponding to our main shaft, *Haupt-schacht*; drawing shaft, or highest shaft, *Förder-schacht*; engine shaft, *Kunst-schacht*; air shaft, *Licht-loch-schacht*. Shafts may be in some instances perpendicular, in others inclined, in the collieries they are in almost all cases vertical, in other mines it is a matter of great doubt and great discussion as to which kind is the best.

As regards the form of section, the rectangular is most common in metalliferous mines, and is used in some collieries, as in those of Pembroke-shire and Scotland, and in many continental ones. Where brick or stone work is applied the sides may be arched, and the arches abutted against one another, and thus you bring in a great element of safety. These curved sides are common in some parts of the Continent. Probably this modification led to the introduction of circular or elliptical shafts, the former being the most common form in Great Britain, the latter very common in South Wales. In Belgium and North France polygonal shafts are common, sometimes with 18 or 20 sides, and this is generally combined with a particular method of securing them. The deepest mine at present, where the depth is attained simply by one perpendicular shaft, is the mine at Peñabram. In a colliery at Charleroi, in Belgium, a depth of over 1000 metres has been obtained, but it is now working only at 800 metres.

If the lode inclines considerably from the perpendicular there may be reasons for sinking in the lode rather than in dead ground, and in such shafts the terms of inclined, oblique, or underlay shafts are given; while to distinguish the perpendicular shafts the term "right" is applied. These inclined shafts are principally in favour in Saxony, Cornwall, and in some other British mining districts. The reason seems to be that in lodes of moderate breadth, and country of moderate strength, by opening out the lode to a certain length you have a shaft the breadth of which corresponds with that of the lode, and under favourable circumstances the ore thus obtained will pay the expenses of the shaft. This is an important point; you see as you go on what the lode is like, and you can set off your levels at the most favourable points, and begin to work on a larger scale. There are other cases in which you find a tendency to sink perpendicular shafts away from the lode, driving out cross-cuts at intervals to explore it. At first sight this is not very inviting, because you have to meet very great expense and loss of time before you can get down to the lode. In the Schemnitz district, in Hungary, in the Harz Mountains, in the mines of Nevada, especially in the Comstock Lode, we shall find that these perpendicular shafts have got to be almost universally used, and these are all districts in which the lodes are of unusual size, and the ground unusually soft. In some cases the shaft is sunk by the side of the lode, and the lode is cut from time to time, as by a level driven along the side. If we begin to sink on the back of a lode it becomes awkward when the lode changes its underlay; and if this takes place suddenly there is a very great deal of inconvenience in putting in cranks at these angles, so much so that in some cases it is advisable to cut away the lode on the foot wall side. Again, in lodes where you have a slip in particular kinds of ground, it becomes a question whether it will be best to drive the shaft in the first portion or at some distance away, so as to meet the second portion of the lode, and then you are not sure but that there is still another slip, and the lode continuing in that. So that if it be founded on a knowledge of the ground, it may be best to go away from the first part of the lode altogether to sink. In these cases such shafts will always remain behind a well sunk perpendicular one. In some cases it would be difficult to deal with the shaft otherwise than by these inclined ones; they may be held to be serviceable to a certain depth, after which they ought to be replaced by perpendicular shafts. In the western parts of England, where the mines have attained great depths, it will commonly be found that the first operations have met this difficulty fairly in the face; that having reached a certain piece of productive ground by means of an inclined shaft on the lode, they go to the expense of commencing a new arrangement, and sink a perpendicular shaft from the surface to intersect the lode at a depth of 100 to 150 fms., according to the nature of the ground. At the Treasavean Mine the shaft intersects the lode at a depth of 250 fms. Every angle you have in a shaft renders it more impossible that the workings can be carried out beyond a certain depth. One of the most remarkable cases the lecturer knew of changes of direction in the shaft was the following. A rectangular shaft was carried down to the adit level at a depth of 20 fms., there it met the lode dipping towards the south, and was sunk on it till at the 14 fms. level it met a lode dipping the other way: they preferred the look of the latter, and sunk on it pretty regularly down to the 112 fms. level, where it again met with a lode dipping in the opposite direction and followed it. It is a most exaggerated case, and ought never to have been allowed to exist. Where, as in Cornwall, the levels are sometimes carried to a considerable distance under the sea, an inclined shaft from the shore may be sunk to some distance, giving you an efficient means of ventilation, at the same time that it enables you conveniently to load into the wagons.

As to the size of the shafts, they vary very much. In the older districts it will be found that they are on an extremely small scale.

as compared with newer shafts. Thus in some old collieries in the neighbourhood of Bath there are curious examples of shafts not more than 4, 4½, 5, or 6 ft. in diameter. You may see also in some old tin mines of Cornwall shafts only 3 or 4 ft. long and 2 to 2½ ft. broad. The lecturer had seen, not long ago, in West Germany some shafts put down for the purpose of getting phosphorite no larger than those mentioned near Bath, and lined merely with pieces of withy stick, plaited into one another, like basket work. Such shafts as these are useful only for very shallow deposits. At the present day it is usually the case that in metal mines they have dimensions of 6 by 5 ft., or 8 by 5 ft., or 8 by 6 ft.; and engine shafts for pumping and for the passage of men 11, 12, or 13 ft., by 6 or 8 ft. We do not in England generally have them on such a large scale as on the Continent. Some of the most notable in Hungary and the Harz are as much as 5 ft. wide between the timbers and 20 ft. long. The length may be decided by the presence of natural joints, &c., giving greater facilities for the cutting. In the great mines of the Comstock district the main shafts run from 20 to 24 ft. long by 4 to 6 ft. wide. Turning to the colliery districts we shall find that they have increased very notably of late years. Not more than 20 or 30 years ago shafts of not more than 5 to 8 ft. diameter were put down; now shafts of 14 or 15 ft. diameter are frequent, and in some of the larger collieries as much as 20 ft. Some of the elliptical shafts of South Wales are as much as 22 ft. long by 16 ft. broad. One use of these larger shafts is that you can use different divisions for particular kinds of apparatus.

Supposing you have a lode coming up on the side of a hill, which you imagine will do well at a certain moderate depth; if it dips with the hill (in the same direction as the slope), the shaft will be put down on the foot wall side, to intersect the lode at a certain depth. But if the lode dip against the hill, then there will be a choice of three methods, either to sink in the lode itself, thus providing all the way, or to sink in the higher ground a perpendicular shaft to intersect the lode, or one on the foot wall side, and to drive out cross-cuts. In the second case you would have a larger shaft to sink than in the last case; the sinking is more expensive than driving. If large quantities of ore are extracted, too, the shaft sunk in the lode itself will be sure to succumb. That on the hanging wall side would require to be very extensively supported, that on the foot wall side would not be affected. So that there are more reasons for sinking on the foot wall side of the lode, although the lode dips away from the shaft more than at first sight would be imagined.

An important discussion upon the utility or otherwise of limestone in connection with puddling various classes of iron has taken place at a meeting of the Mill and Forge Managers' Association of South Staffordshire and East Worcestershire, Mr. WM. FARNWORTH, the president, in the chair. Mr. SKIDMORE, who had himself worked it, was of opinion that with careful handling and a great heat limestone when puddling certain classes of pig would improve the quality of the iron. Some few years ago he had met with a statement in one of Percy's works to the effect that in the manufacture of puddled bars limestone was injurious. He was prepared to contradict this, for in the case of a grey iron he had used it, and had obtained through the use of it the same. He had experimented with grey limestone from the Wren's Nest (near Dudley), and for a time a pair of squeezers was used to shingle the pulled ball. This machinery, however, was found to be wanting in power; the squeezers did not work with sufficient speed, and the old shingling hammer had to be resorted to. The heat of the furnace had to be very hot and quick. Limestone would not do when native pigs were used, for it would cause red-shortness. In the case of an pig iron limestone would aid the iron, and the iron would be cleaner, and would not be so brittle. It was a pity that would not be sooner, and by adhering to the plates would save the bottom from burning. It also gave the puddler a sort of glue to help him in his next heat. If all mize pigs were used the clinder would not have the advantage of adhering to the plates. The speaker went so far as to say that in his view the use of limestone added to the yield. Even quicklime, which he had also worked, did as much, though perhaps did not increase the fibre of the iron. He knew a firm who had used it, and they had not complained of it, so he was sure the case they still used it, that alone was sufficient proof of its utility. When manufacturing cable chains this firm also used it with profit.

Mr. JOHN JEVES considered the use of limestone for fettling was antiquated, though in the case of weak iron it might perhaps be used with advantage, but it would require great care. Some 30 years back, when at an ironworks in Shropshire, the wire-rolls turned out were very red-short. This defect was due to the use of limestone, and he had been told that the puddler had used it. He had seen the iron when the iron was weak and cindery the spaker himself had used limestone, and the effect was to make cold short iron more fibrous. Only a little time previously, too, he found that the iron was working rather grey, and as there was at hand but one means of remedying it he employed limestone. This experiment was often used with some degree of success, for it brought the iron forward sooner by this means the slaggy clinder. Instead of limestone a mixture of pottery and lime of the same kind was used, and the iron being, as he had known, of the same kind as was in South Staffordshire physied clinder was being used as is fettling instead of either the one or the other.

material of either time or of color. If the iron might be raised in the puddling furnace by employing a blast, or something similar. If limestone was used it could not be left to the handling of the workmen, the forge manager would have to deal it out with much care. A certain portion of the limestone (that especially which was grey) might be probably used with weak iron, but other portions of it were also required. Often when in a large furnace, the puddler might help the pigmen, they in turn might help him. I did not know how to grow into his furnace, as much as I did, as he liked he might run out a good yield, but they all knew what would be the quality of his iron.

Mr. BARNETT and Mr. EDWARDS both stated that when limestone had been employed the puddled ball often exhibited serious defects when under the hammer. The reason stated for this was that it might perhaps be due to the impurities of the limestone, and not to the limestone itself. No doubt a perfectly good flux, the result in great part of a hot furnace, was very important. It would only take up a certain amount of cinder, which it itself made from the iron, and assisted the puddler to some extent. The limestone being of a somewhat silicious nature it held nothing but the iron to act upon. If bull-dog was charged into the furnace with the iron, and the flux was not good, that large amount of iron would be gone, which would flux. He agreed with what Mr. Skidmore had said. The reason why limestone would be beneficial to a weak pig was because it at once came into contact with something of its own nature, and by further fluxing the iron made a richer product. If cinder pigs were used a good yield would be the result, but if lean mine pigs were used the yield would be inferior. With reference to red-hot iron, when the iron was cold, when the iron was cold, when the iron became red-hot. This red-hotness, however, could be mastered by fagoting the iron over again.

Mr. HANSEN, though he had read many works on the subject, had not only found one—but that was a Belgian work—written by a civil engineer in 1898, and published in Amsterdam, which professed to give an explanation of the beneficial action which limestone when used as a lining to the puddling furnace had upon the iron produced. The publication said:—“In lining the puddling furnace with limestone the iron is freed from phosphorus, and the phosphorus is converted into phosphoric acid, which is absorbed by the limestone and exhaled.” The speaker was not prepared to say whether or not this opinion was correct, but it certainly seemed to confirm the ideas which the other members had expressed—that limestone was beneficial to lean pigs. He

where the limestone got rid of its silica.

Mr. JOHN LEVETT then rose, and said that not only had the members of the Association to contend against the silica contained in the fuel, but also against the evil which attended the charging of the furnace with pigs that always had much of the silica of the iron, which was almost pure silica. This silica they knew adhered to the inside of the furnace, and was a bad flux, and it formed a scale on the pigs, and in the puddling furnace tended to impart to the iron turned out cold-shortness rather than red-shortness. Iron that is produced would be spilly or dry, and would not weld properly. One of the chief causes of red-shortness was the presence of sulphur, and of cold-shortness the presence of phosphorus. Absence of silica would be one reason of the red-shortness.—The PRESIDENT remarked that red-shortness generally was no doubt due to the richness of the iron, but in the case of less pigs, where limestone was employed, it would be the result of a too large amount of iron in the iron, and so belong to very dry. —The only reason Mr. LEVETT could think of, time improved that fact, that it made a more powerful flux. Lime by itself would not melt very readily, but when oxide of iron and silica were added a good flux was produced. As to the limestone increasing the yield, he should attribute that fact to the better class of pigs used at one time than at another, and not to the limestone itself. The presence of magnesium in some qualities of limestone was a great evil against which they had to contend, and it was to this that he attributed the fact that some limestone was inferior for use in the puddling furnace to other. In the North of England he had worked limestone that was so rich in iron, that the iron produced never had a good welding property; it was so red-hot. The ends of the rails used to draw across it were not so good as the rolls. He questioned the utility of limestone. It might do when the product was nail sheets or other qualities of iron not requiring re-heating; but for iron that had to be again put in the fire by the blacksmith, it was of very little if any service. If a large quantity of lime was in the flux it was present in a more or less degree in the iron. The lime was not easily reduced to calcium, and what was wanted was something which would prevent the iron from absorbing the oxygen when it was being welded. If limestone benefited iron at all it was because by bettering the flux it caused a glassy skin, and by imparting to the iron a fluxion native in the iron, and so the iron produced was better welded; and in the iron had, ever since he could remember, used clay of an unimpaired native fluxion native in the silica; native iron was not so good as limestone. He was of opinion that it was not the immediate action of the limestone upon the iron that gave them an advantage in the using of it, but that combinations which tended to purify the iron were formed more easily when lime was used than when it was not. It would not make a better yield, but the impurities would congregate more readily. It must not, however, be forgotten that an accurate test could only be obtained by very carefully watching the furnace from the time when the charge became molten until it was poured out, and that a minute attention must be given to the iron as it comes out of the furnace every two or three minutes, and examined. His own impression was that the use of lime would get rid of the silica, phosphorus, and sulphur, which were so objectionable.

A MEMBER here said that some iron which had just been worked under his hammer was sufficiently liquid when molten to destroy any fetting. He could not get any fetting to stand it. None of the pigs used were of Staffordshire make, but about a month ago he had experimented with Staffordshire pigs in the same way, but even then he could get no fetting sufficiently refractory. In each case, after the first heat, he not only had the cinder out, but the metal was clean and free of the furnace. Notwithstanding this, he was so well pleased with the result, and the effect of the lime that he should not give up his experiments till with the beneficial result would stand the intense heat. The iron turned out made him find a class of iron that would stand the intense heat, and this iron had not been found in any other kind. In three out of four instances the yield was excellent. He could not, however, say that at present it was a commercial success, because in each case he lost a set of bottom plates would be required.

Mr. HEALEY considered that carbonic acid gas would be given off as soon as it became free. It readily took up with the phosphorus in the slag, and the result was a phosphate of lime. — The PRESIDENT thought that lime, when used as a setting, would benefit the iron by not giving off its carbonic acid until it became somewhat oxidised.

Mr. RIGBY, however, was of opinion that the carbonic acid would be given off as soon as the lime became red hot. — The PRESIDENT said that if that was the case the iron would derive no benefit whatever from the limestone.

The Association hesitate at present to pronounce a definite opinion on the subject. At this stage of the investigations which are being conducted the general view entertained seemed that limestone is not useful in connection with the puddling of iron except in special cases, and then great care must be exercised. So important, however, is the subject to the malleable iron industry that it was understood that the experiments would be continued, and in the light of these additional experiments the question be further discussed on a future occasion. At that time the Association will be asked to take place the Secretary announced that he had communicated with the Government to obtain the necessary facilities for the requisite situation for the visit of the Institute to Works, and had obtained the necessary permission for the visit of the Institute to the Works of the Steel and Iron Factories on June 23. Members expressed their gratification at this, and the arrangements were made, which promise an interesting and successful inspection. The visit it was resolved should occupy two days.

At the Institution of Civil Engineers, on Tuesday (Mr. ANTHONY, Vice-President, in the chair), the paper read was "On the Permanent Way of Railways," by Mr. R. PRICE WILLIAMS, M. Inst. C.E. When ten years since the subject of the maintenance and renewals of permanent way was discussed at the Institution, steel rails might be said to have been on their trial. In the few instances where they had been used they were laid rather as an experiment at stations, and in situations where, from the slow speed of the traffic, no risk was incurred of those sudden fractures to which, it was feared, their brittle character rendered them peculiarly liable. Experience has, however, shown that these fears were groundless, and that steel, with the percentage of carbon used for rails, was a material greatly superior to iron in strength and in durability, and not more liable to sudden fracture. Steel rails had now almost entirely superseded iron rails on the main lines in this country, and the recent reduction in cost of manufacture would probably lead to their

In 1855 the author showed that the average life of iron rails under heavy traffic was but only three years. Since that time the goods and mineral traffic season after season of the Great Northern Railway has been doubled, and even tripled. As might be expected, this had led to increased expenditure in the maintenance and renewal of the permanent way, but in nothing like the same proportion. The fact testified to the more durable quality of the materials. Thus, in the last ten years the Great Northern Railway the tonnage had increased 177 per cent., while the cost per mile of maintenance had only risen 45 per cent.; on the Midland the tonnage had increased 113 per cent., and the cost of maintenance 64 per cent., the chief portion of this latter increase being for materials. On the South Eastern and the London and Brighton lines, the relatively small increase in the cost of maintenance per mile was observable, but there had been a considerable increase in the cost of staff and office charges.

posed of staff and finance charges. The cost of the railway companies were required to be compared according to a uniform system. The distinction between the maintenance of the rolling stock and the maintenance of the track and the maintenance of the signal and telegraph systems was then abolished. The cost of maintaining the sidings, points and crossings, hitherto included "Station Works," was charged against "Main Line Works." The author had arranged the tables and diagrams in accordance with the new system. In comparing the cost of maintenance on different railways it was necessary to take into account the gradients, weight, and speed of traffic in each case, and to take into account the length of the railway, the number of sidings, etc. To afford a common basis of comparison, the author had on the one hand the maintenance both per mile of railway and per mile of single line; and on the other hand the maintenance per mile of railway and per mile of single line. The uniformity was found in the latter than in the former.

The average cost of the maintenance and renewal of the permanent way at Great Northern Railway during the year 1865 was 124*l.* per mile of the single line, the net cost of re-laying a mile of single line with iron rails being 131*l.*, providing the latter amount by 124 gave years as the average "money life" at the time; in other words, the annual sum then spent would renew the entire net of the railway in that period. In 1873, when steel rails were used, the cost of re-laying a mile of single line with iron rails was 137*l.*, the net cost of re-laying a mile of single line being 129*l.*, giving a "money life" of 10 years. The "money life" of this permanent way had, therefore, diminished during the last ten years, a result due partly to the rise in wages, but equally to the increase amount of labour in upholding the sub-structure of the road: in fact, the cost labour in "maintenance" amounted to four times that required for "renewals": comparing the average cost of the maintenance and renewals of the nine principal railways in 1865 with the average cost of the maintenance and renewals in 1873, the first cost, and that consequently the "money life" was the least—only 3*l.* 10*s.* the maximum "money life" being found on the South Eastern and the London and Brighton Railways—10*l.* 5*s.* and 10*l.* 5*s.* years respectively. The average annual cost per mile of single line of the nine railways alluded to during the last 10 years was about 158*l.* per annum, equivalent to an average "money life" of 7 years, assuming iron rails to have been used for the renewal. During 1873 the average cost of the maintenance and renewals of the nine railways was 124*l.* per mile of single line, which, assuming, as was not the case, that steel rails were used, would be equivalent for renewals, gave only 7½ years as the present "money life" nearly one-half the railway mileage of the kingdom. The annual cost of maintenance of the permanent way on these railways represented 2·10 per cent interest on the ordinary capital, so that one year's increased "money life" would be equivalent to an addition of ¼ per cent. interest on such capital—a fact not

The actual life or duration of the permanent way should not be confounded with the "average life," which is a purely arbitrary estimate of the cost of maintenance based on the cost of construction. In the author's previous paper was mentioned that some iron rails on the portion of the Great Northern Rail had only lasted 2½ years. The rails which replaced these in 1863, guaranteed seven years, were not taken up until 1876; in the meantime, however, a great portion of them had been renewed, so that the life of the rails was only about 10 years. This was due to the excessive weight of tonnage, and to the frequency of the trains. Thus, on the loop line of the Great Northern Railway from Peterborough to Gainsborough, which was opened in 1845, and where the traffic was much smaller than on the main line, the earliest renewals of the rails occurred in 1865, and only within the last year had the up line been renewed. On the main line, however, the rails were renewed in 1863, and the rails after 25 years wear, during which period about 30,000,000 tons of traffic had passed over them. The East Lincolnshire section of the Great Northern Railway was opened the same year as the loop. Only 21 per cent. of the up line and 10 per cent. of the down line had been renewed, the rails still in the road having carried 10,000,000 tons on the up and down lines respectively. During the last 10 years 85 per cent. of the mileage of the Great Northern Railway had been renewed and the average life of the rails was nearly 16 years. With this average life of the rails, and assuming that sleepers lasted eight years, the estimated average renewals per annum would be 125 900. per mile of single line, while the actual

Steel rails were first laid on the London and North-Western Railway at Cundeston in 1862, and at Crewe Station in the following year. Diagrams were exhibited showing the wear and amount of tonnage which had passed over the rails. On an average it appeared that a wear of 1/16th of an inch of the top of the rails occurred to a traffic of 9,370,777 tons. On the Great Northern Railway steel rails were first used at the coal sidings at King's Cross, but the tonnage over the rails could not be ascertained. In February, 1867, steel rails were laid in the up and down lines in Midland Lane Tunnel. On the down line the traffic was of a heavy character, consisting chiefly of slunting. A diagram was exhibited, showing the wear on the top of the rails, the tonnage over them, and the chemical analysis of the steel. The traffic corresponding to a wear of 1/16th of an inch of the top of the rails varied from 5,251,690 to 31,681,000 tons. Similar diagrams were exhibited, showing the wear, the tonnage, and chemical analysis of steel rails on other lines of the Great Northern Railway. Steel rails were first laid in the railway at Epsom in 1866-7, on the up line, near Horney. A template of one of the rails was exhibited, showing a wear of only 0·15 of an inch at the top of the rail, after a traffic having been 85,000 tons, equivalent to 27,272,000 tons for every 1/16th of an inch. The proportion of carbon in this rail was only 0·320 per cent. The design for this communication was all made by Mr. Rilev.

The Metropolitan Railway was opened in January, 1833, from as far as Farringdon street, and the extension to Moorgate street in 1855. The greater part of the rails had been worn out, and in some cases the rails were so much wearing so the enormous traffic. The rails were changed at the stations, where the breaks at intervals had the maximum effect, that was intermediate between the points where the breaks were first applied and the station platform. Diagrams were shown of the wear outlines of these rails, of the tonnage over them, and also of the chemical analyses of the steel—the most noticeable features being in the case of the rails in the Gillingham tunnel, where a considerable difference in the wear was observable in the wet and dry portions of the tunnel, although the amount of traffic was the same.

In a recent paper the process of hammering the ingot had been recommended in preference to first cogging it, and then rolling it into the finished rail, the latter process having, it was stated, the effect of injuring the metal. The author had some experiments made at Mr. Kirkaldy's, with a view of practically testing the relative merits of the two systems. The result of these experiments showed that rails rolled direct from a cogged ingot had decidedly the advantage, being about 2½ per cent. stronger on the average than those rolled from a hammer ingot. The Great Northern Railway rails rolled from cogged ingots had endured ten years' service, but those rolled from a hammer ingot had only a few months' duration.

The author had also made experiments as to the relative strength of deep ordinary fish plates, the results showing that the strength of the solid rail was 65-68 per cent of the strength of the solid rail, whereas the average strength of the ordinary fish plate was only 22 per cent. Experiments were likewise made to determine the transverse strength of steel rails, with punched, hot and partly punched and drilled fish-bolt holes; likewise steel rails which, before being subjected to punching, drilling, &c., had been toughened by dipping into water when hot. It was thus ascertained that the strength of steel rails subjected to the toughening process, with holes punched cold in the ordinary way, was 65-68 per cent. of that of the solid rail; whereas the strength of the rails which had been hot and partly punched and afterwards drilled was 97-99 per cent. of the strength of the solid rail. The effect of the toughening process was materially to increase the strength of the steel rails,

FIBROUS PUDDLED IRON.—In a paper addressed to the Academy of Sciences M. H. Le Chatelier adds some important information to our knowledge of this most important of all metals. The fracture of a bar of puddled and rolled iron generally presents a fibrous texture, denoting a complete want of homogeneity in the metallic mass. This is due to the presence of extraneous matter mechanically interspersed in the iron, and which has hitherto been considered to consist of scoriae from the puddling furnace and oxides of iron but no direct analysis had until now been undertaken to settle the question, and no attempt been made to separate these impurities from the mass. Following M. Schiesing's plan for the analysis of cast-iron, our author caused a stream of chlorine to pass over a piece of fibrous iron at a dull red heat. The metal was thus entirely volatilised, leaving behind a skeleton of the exact shape of the original piece, but of such extreme tenacity and lightness that it would fall away by merely blowing upon it. The colour of this residue was greenish white; it consists in a great measure of silica, with a small proportion of oxide of iron—in fact, the scoriae mechanically enclosed in the mass, and which resisted the action of the gas, while the iron and the metalloids combined with it were completely volatilised. The proportion of this residue is about 1 per cent. of the whole mass. But there is this curious circumstance to be remarked, that the extraneous particles are not capriciously disseminated, but are

portant statement is confirmed by Mr. Coward, when he says—"As the mine is now, 300 tons per month can be extracted by fair working." The calculation is that each ton of ore will leave a net profit of 10%, in which case the present output should realise a profit of 3000% per month, or 36,000% per annum, upon a capital of 60,000.

BLUETENT CONSOLIDATED (HYDRAULIC GOLD).—The announcement that water is flowing through the entire length of the company's canal, from head to point of the operations, makes a fresh start in the history of the company, and cannot fail to give an impetus to the affairs of the undertaking, as it is the first time that anything even approaching an adequate supply of water has been obtainable. Although the canal was finished in October last the heavy and continuous falls of snow blocked up the course, and prevented any water passing through; the same cause operating also against the purchase of water from other ditch owners. The value of this canal to the company will be appreciated at once when we mention that the water used in the desultory washing of last season, when the work was idle for days together waiting for a supply, cost \$14,500—a sum sufficient to pay the interest on the debenture for 12 months. Now, however, that an abundant supply of free water can be obtained the opening up of the property will be more rapid, and the returns more commensurate with the undoubted richness of the gravel.

PATELEY BRIDGE LEAD MINES AND SMELTING COMPANY.—The report is again most satisfactory. The Lumb vein continues to yield good ore, worth 1 ton per fathom, the lode being 4 ft. wide. Fielding's is worth, at the two points, 2½ tons per fathom, and likely to further improve; the engine-shaft is being sunk vigorously. The Pringap vein, a point of the greatest importance, is producing good ore, and encouraging in appearance. The Sun vein, another of the important points of operation, is producing 1 ton of ore per fathom; the vein in the stope is improving, now producing 1½ ton of ore per fathom. Shares are firmer.

WEST PATELEY BRIDGE (Lead).—Some good stones of solid ore have been broken from the bottom of No. 1 shaft. A cross-cut has been commenced in the 42, where it is reported a fine lode was cut into in the forebreast, with solid branches of lead ore. The shares are enquired for at quotations.

WEST ASHETON (Lead).—The latest information is to the effect that the lode in the 40 is 3 ft. wide, 18 in. of which is solid lead; the shaft has reached a depth of about 68 fms., and the lode will be intersected in the 60 cross-cut in the course of the next few days. The 70 is expected to be reached in about three weeks; the sinking of the shaft will be vigorously continued to the 80.

RAILWAYS.—In this department there has been little to encourage purchases beyond the expectation—made the most of in some quarters—that the traffics will be heavy during the Whitsuntide holidays. The returns of the southern lines show a considerable decrease. The tendency, however, has been towards greater firmness, without considerable improvement in any one instance.

FOREIGN BONDS.—The leading feature has again been in Egyptian. As prices in the early part of the week came better from Paris, there was more inclination to take a hopeful view of the future. Purchases on Paris account had a re-assuring effect, and though the intimation of the payment of the coupons of the Nine per Cents, only affects a loan of 50,000*l.*, it was not without its influence.

MISCELLANEOUS.—In the American railway market there has been a fall in Eries, both ordinary and preference. In Canadian, Grand Trunk Preference and Canada are fractionally lower.

PNEUMATIC STAMPS.—At a former meeting of the Killifreth Mining Company a resolution was passed authorising the agents to purchase and erect suitable steam-stamps according to the requirements of the mine, whenever they deemed it necessary. Since then enquiries have been made as to the best stamps to be erected, and trials have taken place in the presence of the agents of Mr. Husband's Pneumatic Stamps, with the most satisfactory results. At the meeting last week Captain Gough spoke very highly of them, and expressed himself pleased with the results that were obtained. It must be remembered that the principle of his stamps, and the improvements he had made in them since the pneumatic stamp was first introduced into this country, about seven years ago. He undertook, if his stamps were adopted in the mine, the wear and tear of them for two years, and guaranteed that it should be less than the wear and tear of the best constructed stamp in the county of Cornwall. Some discussion followed, during which it was stated that Scholl's pneumatic stamps were about to be tried at Wheal Kitty, St. Agnes, and eventually it was determined that the agents should witness this trial before it was decided which set of stamps should be used.

"PROMOTION MONEY."—The action of the Huntington Copper and Sulphur Company (Limited) against Mr. William Henderson, chemical manufacturer in Glasgow and Irvine, for payment of 10,000*l.*, the sum which, it is alleged, he received as promotion money for obtaining directors for the company, was brought before Lord Young in the Court of Session, at Glasgow last week. It is alleged that the mines purchased were not worth half the money, that the reports were incorrect, and that the defender acted illegally in accepting the 10,000*l.*, the restitution of which is now demanded. Mr. Henderson, on the other hand, maintains that the money he obtained was for substantial services rendered, and that that he was a gainer, but a loser by the transaction. Lord Young expressed an opinion adverse to the claim of the defender. His Lordship believed that a legal fraud had been committed, though he did not attribute to the defender personal or intentional dishonesty; he simply followed a bad habit which is common among many men who would not do a dishonest action. Lord Young warned counsel that any evidence they might lead would have no effect upon his mind; but having said so he left them to pursue what course they thought best. Expenses were then fixed for the pursuers at 10,000*l.* and interest. As, however, the case was important, his Lordship said he would put his reasons in writing.

WINFORD RED HEMATITE IRON ORE COMPANY.—Owing to some misunderstanding between the members of the Committee of Investigation appointed last year, exception has been taken to the arrangements entered into between the committee and the directors for the amicable adjustment of disputes, and Mr. T. Sherwood Smith, who is just recovering from a severe illness which has incapacitated him for many months, has published the hostile report originally prepared by himself and two other members of the committee of investigation. The very first paragraph questioned, "it was referred to the solicitors on both sides, Mr. Underhill for the company, and Mr. Rowlands for the committee, to confer with the committee as to an offer to be made by certain of the directors to purchase the assets of the company." A substituted report drawn up by the committee was issued. This Mr. T. S. Smith did not sanction, but stipulated that whatever offer was made on the part of the directors it should be made to the shareholders to accept it, or to remain in the hands of the directors." Mr. Smith was not satisfied with this, and the shareholders became aware that such a right had been stipulated for, and it is utterly repudiated on the part of the directors; he considers there has been a breach of faith, and, therefore, publishes the report. The committee were appointed on Oct. 13, 1875, and all facilities were rendered them by the directors and officers of the company with free access to the books, deeds, papers, and documents belonging to the company. The Red House estate, Winford, freehold, was purchased of Mr. Higginson by Mr. Gibbs for 9700*l.*, of which 15,000*l.* was paid down, and the balance of 8200*l.* was to be paid in 1876, and after, for 15,000*l.* The committee considered the prospectus and reports misleading in very important particulars, especially as to the quantity and quality of the iron ore. The purchase by the company of the estate for 10,000*l.* in cash and 5000*l.* in shares was confirmed at the first meeting of directors. The fully-paid 5*l.* shares was confirmed at the first meeting of directors. Then himself and seven other gentlemen who had undertaken the formation of the company. These gentlemen are not named in the prospectus. A directors' Association, and there is nothing to show that any director or officer of the company was interested in the purchase of the property. The 9000*l.* balance of purchase was paid six weeks after the formation of the company, but there is no minute as to the previous payment of 1000*l.* From October, 1872, to July, 1875, there was raised 22,863 tons of ore, 735*l.* in 1872, at a cost of 573*l.* 17*l.* 4*d.*, upon which there was paid wagon value at 1*l.* 8*d.* cartage to Bristol, 375*l.* 12*l.* 4*d.*; railway cartage, 553*l.* 4*d.* total = 11,747*l.* 6*d.* On Oct. 17, 1875 tons were sold for 5000*l.* and the balance was valued at 1120*l.* 15*l.* 6*d.* making a total of 12,867*l.* 12*l.* 4*d.* in all, and showing a gross profit of 238*l.* 1*l.* 8*d.* on the 24 years trading. The trade discounts, directors' fees

CONDOS DE CHILI (Silver-Lead).—Mr. James Seccombe, who has just been sent out to represent the company, has telegraphed that he has made a cursory examination of the mines, satisfying himself that they are very valuable; the Isolina Mine, Mr. Seccombe says, will easily produce 300 tons of ore per month; he estimates the ore in sight at 3000 tons; samples taken from the bottom yielded 55 ozs. of silver per ton. One of the most important statements is that the mines can be worked during the whole year. Mr. Seccombe advises the shipment of only the richest ores, and smelting the remainder (a smelting establishment is included in the purchase). The whole of this information is entirely confirmatory of that previously received from Mr. Coward, of the Argentine Company. It may be useful to mention that the strata are principally porphyry, and that the company has seven distinct mines scattered about upon the south side of the mountain. Each mine has 800 varas on the length of the lode, by 100 varas wide. From the distance each mine is from the other, and the nature of the ground, it is difficult to know positively whether they all have different lodes; the general opinion being that such is the case. Each lode is strong and masterly in appearance, varying in width from 1 to 2 metres, and all containing more or less metallic mineral—sometimes argenteiferous lead by itself, and sometimes argenteiferous lead in connection with argenteiferous copper, and sometimes the latter alone. Up to the present time the mining operations have been conducted in the most primitive manner, yet large profits were realised. We have already mentioned that Mr. Seccombe computes the reserves in the Isolina Mine at 3000 tons; Mr. Coward, upon this point, says—"In estimating the reserves of ore standing in the mine the state in which the ore will be sent to market must be taken into consideration; if the ore be sent to market as it has been by the native workers, there are about 2500 tons standing, yielding a ley of (say) 45 per cent. lead and 50 to 60 ozs. of silver per ton; but by jigging, the reserves may be reckoned at something like 2000 tons, with a ley of lead of 55 to 60 per cent. and of silver of 70 ozs. per ton." Mr. Seccombe's other im-

pendon Commercial, 11; Hedden Bridge Cotton, 10; Yorkshire Boiler Insurance Company, 22s. 6d.; Norton Brothers, 8.

* With this week's Journal a SUPPLEMENTARY SHEET is given, which contains—Original Correspondence: Pacific Coast Mining Notes—The Richmond Imbroglio (J. D. Power); Credit Foncier of England (Limited); Plant & the Blackly Hill Colliery Company (Limited)—now in Liquidation; Blackly Hill Colliery; Mining in the Van District—the St. Harmon Mine; Copper Deposits at Saddle Vale, Carnarvonshire (J. Roberts); Mining in Cardiganshire; Cardiganshire Mining; Cardiganshire Mines, New and Old—No. V. (A. Francis); Dues—Cornish, and Crown; Unwrought Mining Ground of Gwennap, Cornwall (C. Bawden); A Proposed New Industry for Cornwall (R. Symons); Open Shafts; Mining & Undermining (T. Vosper); West Chiverton; New Rosewarne; Mining in the St. Blazey District (J. Treasott); Pennerley, and the Mining Circulars; Roman Gravels—The Quicksilver Market, and its Prospects—Foreign Mining and Metallurgy—Foreign Mines—Meetings of Nerubudda Coal and Iron, New Rosario, and Snowdrift Companies, &c.

The Mining Market: Prices of Metals, Ores, &c.

METAL MARKET—LONDON, MAY 26, 1876.

IRON.	£ s. d.	£ s. d.	TIN.	£ s. d.	£ s. d.
Pig, G.N.R., f.o.b., Clyde.	2 18 6	—	English, ingot, f.o.b.	81 0 0	82 0 0
Scotch, f.o.b., No. 1	2 18 0	3 8 0	bars	82 0 0	83 0 0
Bair, Welsh, f.o.b., Wales	6 5 0	6 10 0	refined	84 0 0	—
" in London	7 0 0	7 2 6	Australian	75 10 0	—
" Stafford	8 15 0	10 5 0	Banca	84 0 0	(nom.)
" in Tyne or Tees	7 0 0	—	Straits	75 0 0	75 10 0
" in Sweden, London	12 10 0	12 15 0			
Rails, Welsh, at works	5 15 0	6 0 0			
Railway chairs	—	—			
" spikes	—	—			
Sheets, Staff., in London	10 10 0	11 0 0			
Plates, Staff., in London	10 12 0	11 0 0			
Hoops, Staff.	8 15 0	10 0 0			
Nail rods, Staff., in Lon.	7 15 0	8 10 0			
STEEL.					
English, spring	16 0 0	25 0 0			
" cast	35 0 0	50 0 0			
Swedish, keg	15 0 0	—			
" lag. ham.	20 0 0	—			
LEAD.					
English, pig, common	21 7 6	21 10 0			
" L.B.	21 10 0	—			
" W.B.	23 0 0	—			
" sheet and bar	22 0 0	22 10 0			
" pipe	24 0 0	—			
" red	24 0 0	24 10 0			
" white	24 0 0	24 10 0			
" patent shot	25 10 0	25 0 0			
Spanish	21 0 0	—			
QUICKSILVER.					
Flasks of 75 lbs., ware	10 0 0	—			
SPELTER.					
Silesian or Rhensish	23 10 0	23 15 0			
English, Swansea	23 10 0	23 15 0			
Saet zinc	23 0 0	23 10 0			

* At the above prices, 1 lb. to 1 lb. 64. per box less for ordinary 100 per ton less for Canada; 1 lb. 64. per box more than 100 quoted above, and add 6s. for each X. Terms: 2s. per box below tin-plates of similar brands.

REMARKS.—The estimated loss resulting from the non-payment of interest due to foreign bondholders within a year is calculated at not less than \$4,000,000 sterling. If this be so, and there is no reason to believe that it is not, it is no wonder that trade generally is seriously affected thereby. The Governments in default are evidently not in a position to enter upon the execution of extended projects, and the people being already taxed beyond endurance are not likely to attempt through the channels of private enterprise what the authorities decline to undertake backed by the power of official position. The Eastern Question has for some time past caused a feeling of extreme uneasiness, and the state of affairs such that fears as to their ability to meet at maturity are not unnaturally aroused. While this state of things lasts it is any matter of surprise that the metal trade should continue without animation, and that instead of any improvement in the aspect of affairs matters should even be less hopeful than they appear to be.

In confirmation of the views already set forth, we quote the following from a contemporary:—"English railways, if not very closely connected with the Eastern Question, have had specially adverse influences of their own to contend against, in the shape of the most unsatisfactory traffic returns witnessed, we suppose, for years. To a certain extent, though not wholly, the falling off may be explained by the comparison being made with the Whitstable week last year; but some of the lines have obviously suffered from causes of a more permanent nature. A loss in the Lancashire and Yorkshire of 33,000, and in the Midland of 25,000, is certainly not owing to passenger traffic. If the falling off arose not from a decrease of passenger traffic, it is surely a proof that the trade of the country is affected to a most serious extent, and that the goods traffic, as a consequence, is very materially diminished. The railway goods traffic returns may form an important index of the position of the country, and it is not surprising that it is not encouraging to be told that at present they are 'the most unsatisfactory witnessed for years.'

COPPER.—Throughout the week there has been an even market; quotations have shown scarcely any alteration, and business has been upon a limited scale. Australian copper is firm at current quotations, but buyers do not show a disposition to purchase at sellers' limits. At the Swansea Ticketing, on the 23rd inst., the Cape ore averaged 15s. 5d. per unit 31 per cent. produce, and the whole sale 15s. 3d., average produce being 22 11-16ths per cent. Chili bars, g.o.b., are 78s. to 79s.; Burra and Wallaroo, 82s. to 83s. 10s.; English Tough, 82s. to 84s.; best selected, 84s. to 85s.; India, 4 by 4 sheets, 89s.; strong sheets, 90s. to 92s. The business with the East is on a very limited scale, but sellers are disposed to consider favourably any enquiry from India, and contracts any magnitude will probably be placed for this quarter somewhat under current quotations. The exchange with India is going from bad to worse. It is estimated that the loss upon shipments to Calcutta arising from this cause within the last six weeks is not less than 5 per cent.

IRON.—The Iron Trade in South Wales continues to derive its chief support from the Swedish demand, and from enquiries from the colonies. Were it not for these sources of relief it would be vain to look to other quarters for employment for the works. The home trade is very quiet, and the American and Russian demand is nil, and the export trade generally is not even so good as it was at short time ago. Of the three export ports in South Wales, the condition of that of Swansea, at which now little or no business is carried on, tells more of the state of trade in general than either Newport or Cardiff. The eyes of the men are at last opened to the real position occupied by the trade, and the masters are not likely to experience so much difficulty in coming to terms with their employees as they are in obtaining a sufficiency of work to keep them employed.

Turning from South Wales to the North of England, there is no improvement to note. The demand for pig-iron is very sluggish, and the report from from all the producers is unanimous as to this. There are, however, buyers in the market, but at such prices that manufacturers are not prepared to accept. The impression seems to be very general that if some of the furnace now in blast be blown out prices of pig-iron will be maintained, and serious though the loss may be in damping down or blowing out, it is thought that it would be wiser to incur this and maintain the value of pig-iron, than so to increase stocks as surely to bring about a fall in price.

Quotations vary a good deal. Some of the best makers are firm at such quotations as virtually to preclude them from the market, while there are others who are either weak holders, or whose confidence in the stability of the market is not so great as that of their neighbours, who are prepared to do business on lower terms. The average rate of No. 1 pig-iron is 51s.; No. 2, 46s. 6d.; and No. 3, 45s.; but contracts have been passed below these quotations. There is not the slightest improvement in the finished iron trade. Notwithstanding the apparently moderate prices at which all manufactured iron can now be purchased, which are such as to leave but little if any profit to the manufacturer, there is comparatively no demand, and no immediate prospects of better times. Works are in many cases only kept in motion so as to keep the men together, in case an improvement should set in, not from any profit which results from present operations. Rails are quoted at about 6d. for ordinary sections, and plates for shipbuilding 7d. 6d., and merchant bars, 6d. 10s.

The Scotch pig-iron market, which closed last week at 58s. 4d., opened a shade easier, and at the close there were buyers at 57s. 10d. On Tuesday there were sellers at this price and buyers at 57s. 9d. Wednesday's market witnessed no change. On Thursday the market was closed, and to-day there are buyers at 57s. 10d. and sellers at 58s.

Week ending May 22, 1876	SHIPMENTS.	Tons	1876
Week ending May 20, 1876		10,180	8,510

Decrease..... 670
Total decrease for 1876..... 35,254

LEAD.—The market is weak, and good soft English pig is easily obtainable at 21l. 7s. 6d. There is not much doing in Spanish—the quotations for soft quality without silver being 21l.

ZINC.—Out of 120 tons offered at public auction, only 75 tons were sold, at 25l., or a decline of 2s. 6d. upon the previous sale.

SPELTER.—The market is flat, and lower prices have been accepted. Ordinary Silesian has been sold at 23l. 10s. to 23l. 15s. for early delivery.

QUICKSILVER.—The market is dull; quotations unchanged.

Spanish quicksilver quoted 10l. per flask.

TIN.—The advance in this metal which has been reported recently has arisen rather from speculation than from any other cause. The

fact being that operators were weary of the prolonged inactivity of the market, and some among them considered that it might be the least of two evils to venture upon a speculative movement rather than to continue in a condition of inaction any longer. The present stock of tin is so large that unless deliveries should prove to be much larger than there is reason to expect, it is hardly likely that the firmness of the tin market can be upheld. There is a question whether the supplies from Australia will continue to be maintained at the ratio which has been kept up for some time past, and this may have to some extent helped to sustain the firmness of the market, but so soon as operators cease buying the price immediately begins to fall, and however much it may be desired by some to stimulate the market, yet it is very certain there also exists a strong opposition to the upward movement, and which is apparently based upon more solid grounds than those for the rise, so that ultimately there is no doubt that prices will again recede, perhaps more rapidly than is generally anticipated, and that, too, below the figure they started from.

Already sales have been effected wherever practicable for forward delivery at rates below those current for prompt cash, but notwithstanding the reduction, buyers seem reluctant to avail themselves of such opportunities, and so far as concerns the tin market they will not purchase beyond immediate requirements. Although the arrivals this month may not be equal to previous months of this year, yet the falling off in the demand for tin-plates is so great that there will be very much less required for that description of work, and as this forms the chief source of consumption it is pretty evident no advance can be supported for any length of time, and it is evidently most inopportune to attempt anything of the sort.

TIN-PLATES.—The makers are still very badly off for orders, and large stocks are held at the works; the present prices are said to be unremunerative, and therefore no inducement exists for stocking any more; and, low as prices are at the present time, it will probably be found necessary on the part of some of the works to accept lower prices if they are compelled to realise the whole or even any great portion of their stock.

THE IRON TRADE.—(Griffiths's Weekly Report).—Friday Evening, The Glasgow market has undergone no material change. Business was done to-day in warrants at 57s. 10d. to 58s. cash, closing firm, rather buyers, at 58s. cash. Warrant Makers' No. 1 iron—Gartsherrie, 65s. 6d.; Coltness, 67s. 6d.; Calder, 68s.; Langloan, 68s. 6d.; Summerlee, 68s.; Monkland, 69s., f.o.b. Glasgow; Gleanbrook, 68s. 6d.; Eglinton, 67s. 6d., f.o.b. Ardrossan; Shotts, 67s. 6d., f.o.b. Leith; Kennell, 60s., f.o.b. Bo'ness. It cannot be denied that the iron trade is in a depressed condition, brought about by the great falling off in demand which commenced two years since, which has continued to increase from that day to this. No doubt when prices have reached a point which gives merchants and consumers alike a feeling of gloom and despondency, we shall have a favourable reaction in the trade, but not before.

Much is written and said of late of the gloom and despondency of the trade with less truth than the constant persistence of these remarks in certain quarters. We are certainly passing through a severe crisis. Marked Staffordshire bars have already descended from 18l. to 9l. per ton, almost without a single failure of importance. No doubt this tries the pockets and patience of the ironmasters, but up to the present moment both have withstood this severe strain, and, we believe, will hold out until we are at the bottom of prices which we will venture to say cannot be much lower. Prices are often figured below the real market value. A statement was sent forth from London that steel rails have been sold at 7l. 5s. per ton; now we must, in our official capacity, take leave flatly to contradict this statement. Steel rails have not been bought at 7l. 5s. per ton, nor are they likely to be. This class of rail, at all events, will be higher before it is lower.

What may be in store in regard to future prices of iron no one can tell. One thing, however, is certain, that in the great fall of the price of iron which is and has been taking place, and that in two years' time, the iron trade, particularly in new districts which have not had time to form enduring and sterling commercial relations. The meeting at the Middlesbrough Royal Exchange on Tuesday was very quiet and inanimate, with small business and drooping prices. Manufacturing trade here does not improve, and as the Glasgow market is fickle and uncertain, the Middlesbrough smelters watch the Scotch operators and makers with increased anxiety. The meeting at the Birmingham Exchange yesterday was cheerful, and although a small falling off was announced a very good feeling prevailed, to the utter abatement of gloom and despondency.

The works generally in this district are running about four days a week. Second-class bars are flat, and to some extent unsaleable. Hoops may be put in the same category. Sheets, best boiler-plates, and all brands of market bars, are in a little better request. The West Bromwich Iron Company, carrying on business at the Bush Farm Works, will close these works at the end of next week, being unable to make iron at a profit. The Parkfield furnaces have been taken, and two out of the five will be blown in immediately. With regard to our own market, we cannot report to large business. There have been more orders given out this week for Staffordshire sheet-iron; rails are flat and inanimate, at unremunerative prices. The principal features in our market are inactivity and the absence of large transactions. The tin-plate trade is unchanged. 1C coke 19s., but the makers prefer stopping the mills to a large business at this figure.

Messrs. VIVIAN, YOUNGER, and BOND.—COPPER.—On the 19th inst., the charters were advised by cable from Valparaiso for the fortnight ending the 17th inst. as equal to 1800 tons in fine copper of which 550 tons bars for Continent, 1200 tons bars and ingots for U.K., with 50 tons fine in ores and regulus. The exports for April were 3400 tons fine. The market has been steady during the week, with fair purchases of Chili bars by the trade at 78s. to 79s. 15s., according to brand, also to arrive at 78s. to 79s. 15s., closing steady, with buyers at 78s., and sellers at 79s. to 10s. more. English and fine foreign both continue neglected. Wallaroo cake has sold down to 83s. 10s. to 83s. 15s., and other brands at 82s. to 93s. as in quality. Manufactured copper continues in exceedingly sluggish demand, and some speculations from present list prices will be necessary to secure sales.

TIN.—The advance to 17s. 6d. for Straits and Australian has been steadily supported throughout the week; this price being also paid for forward delivery. The shipments from Penang and Singapore for the first fortnight of the current month were valued at only 70 tons, showing the continuance of smaller shipments from that quarter advised during the month of April. English remains steady at 22l. for common ingot;—SPELTER: Prices are again easier. Sales of common brands foreign, 23l. 10s. 6d. to 23l. 15s.;—LEAD dull, with sales of soft Spanish at 21l., and English down to 21l. 7s. 6d. for good shipping brands.

Messrs. HENRY ROGERS, SONS, and Co.—COPPER.—Since the Swansea ticketing on Tuesday, and the fall of 5d. per unit in the price of ore, business has been much restricted. Birmingham will only buy from hand to mouth; the northern portion of the Continent also; and while the Eastern exchange still drops from day to day, orders from India must be scarce. Notwithstanding these adverse circumstances, bar copper maintains its price. A good quantity of English has been disposed of; but fine Australian is very slow of sale, notwithstanding the drop in quotations. TIN: There has been more doing all the week, and prices, after being 77l., have settled down at 76l.—SPELTER: Prices are tolerably steady. The demand from consumers is not so great as usual at this season, but there is a day-to-day business which helps to maintain the market.

Messrs. FRY, JAMES, and Co.—COPPER continues to be inactive, and prices have varied only in the slightest degree. Of Chilian some few hundred tons have been sent to Birmingham, and a very little has been taken, although it is at the moment relatively the cheapest copper in the market. English is slightly easier to buy.—IRON without change.—TIN: The improvement in value of this metal has continued, although the demand has not been very great, and on the faith of the holders of foreign continuing firm the English smelters have advanced their quotations by 4l. per ton.—SPELTER neglected, and lower in price.—LEAD slow of sale, and the turn of value slightly in favour of the buyers.—TIN-PLATES continue heavy.

Messrs. SANFORD and BIRD.—COPPER keeps steady, and during the week a considerable business has been done in Chili bars, and also in English sheets. The market closes firm at quotations given. Tin holders have been firm and buyers eager. This has again advanced about 2l. per ton, and considering the transactions have taken place both in Straits and Australian, but chiefly the former. It closes firm to-day at 76l. 10s. for both qualities.

The MINING SHARE MARKET opened with great activity this week, owing to an advance of 4l. per ton in the standard for tin ore.

Mines generally have participated in the increased business; but tin mines have more especially advanced in price.

The mines most dealt in have been Carn Brea, Dolcoath, Tincroft, Parys Mountain, Roman Gravels, Glenroy, East Van, Glyn, Rookhope, West Tankerville, Van Consols, Wheal Grenville, Wheal Agar, and a few others.

Carn Brea advanced to 40, 42; a month ago these shares were at 27, the rise, therefore, is 13l. per share. Dolcoath is at 36 to 38; a month ago they were 33. Cook's Kitchen, 5 to 5 1/2; a month ago almost unsaleable at 2 1/2. Tincroft have reached 15 1/2 to 19 1/2, a rise of 2l. per share; the price of a month ago, 17l. West Basset have reached 5 to 5 1/2; a month ago they were 4 1/2. South Condurrow, 4 1/2 to 5; Wheal Kitty (St. Agnes), 2 1/2 to 2 3/4; Wheal Grenville, 1 1/2 to 1 3/4; Penstruthal 11s. to 13s.

East Darren, 26 to 27; the directors declared a dividend of 1l. per share on Tuesday. Roman Gravels, 15 to 15 1/2; in the year ending July 20 last, this mine paid 15,427l. 10s. in dividends; expended 1600l. on permanent works, and left a balance in hand of 2976l. The lead ores returned (2344 tons) realised 35,145l. 1s. 6d. The 95 south is now worth 4 tons of lead ore per fathom. The lode in the shaft is 8 to 9 ft. wide, and worth 70l. to 80l. per fathom. The 80 south is worth 120l. per fathom. Tankerville advanced to 10 1/2, 11, but left off weaker; the 157 fm. level has been extended west of Watson's shaft 15 fms., on a lode measuring 8 ft. wide, varying from 5 to 10 tons of lead ore per fathom; the present end is worth 150l. per fathom. South Roman Lead, 1 to 1 1/2. Pennerley, 2 1/2 to 3; the discovery in the back of the 45, on gossan lode, is now in a side course of lead ore, and to all appearances lasting.

Great Dyliffe, 4 1/2 to 5; this mine has improved. The shaft sinking below the 120 is in a lode worth 25l. per fathom. The 120 east is worth 14l. per fathom; in back of ditto, 20l. per fathom. There are 93 men breaking ore, at an average of 5l. 10s. to 6l. 10s. per ton. The last four weeks sale realised about 1470l., and 400l. profit. West Tankerville, 2 to 2 1/2; the 75, north and south of boundary shaft, is

improving for lead, and expected in a few fathoms further driving to be into the profitable ore ground. The 63, south of winze, is mine seems to be opening out well. Rookhope, 21s. to 23s.; Great Laxey, 19s. to 21s.; the 136 has been commenced on a lode which maintains its size, and is yielding saving work for lead in the north end. East Van shares have advanced during the week to 12, 3 to 3 1/2; Asheton, 1 1/2 to 1 3/4; West Asheton, 1 1/2 to 2 1/2; Glyn, Bridge, 4 to 4 1/2; West Pateley, 5 to 5 1/2; Pennant, 5 to 5 1/2; St. Patrick, 25s. to 30s.

South Frances, 30s. to 35s., call paid; at the meeting on the 22nd a call of 6s. per share was made. The loss on four-months working was 1366l. 6s. 7d., and the debit balance 1388l. 12s. 5d. The tin sold during the four months realised 174l. 5s. 2d. The tin lode of West Basset has been cut at the 185, and although not so rich the agents state as they could wish, yet the improved character of the lode in the eastern end fully justifies the hope that better days are before them, and they still believe, when fully developed, a profitable and permanent mine will be the result. Derron Great Consols, 3 to 3 1/2. Parys Mountain, 17s. 6d. to 20s.; in the 90 cross-cut south a vein has been cut about 1 ft. wide, composed of sulphur, flookan, and stones of copper ore; the ground about this point is looking very promising, with water issuing strongly from the forebreast, and the agent is of opinion that a strong lode still exists before them, towards which he is pushing as fast as possible. East Caradon, 1 1/2 to 1 3/4; East Pool, 13 to 13 1/2; Marke Valley, 13 to 24; South Carn Brea, 25s. to 30s. Unity Wood, 1 1/2 to 2; at the meeting a call of 2s. 6d. per share was made.

Prince of Wales, 3s. 6d. to 5s. 6d.; at the meeting (particulars of which will be found in another column) a call of 1s. 6d. per share was made. The accounts for the five months showed a loss of 1052l. 9s. 10d., and a balance of liabilities over assets of 1272l. 10s. 6d. The copper ore sold had only realised 135l. 15s. 2d.; munda, 92l. 6s. The report states that the ends going west are very promising, and in that direction the prospects are encouraging. New Pembroke, 10s. to 12s.; at the adjourned meeting, held on the 16th, a call of 3s. 6d. per share was made. The new discovery at the 100 fm. level has improved to 40l. per fathom. In a winze commenced below the level, and down 3 ft., the lode is worth 4 tons of copper ore, or 32l. per fathom. The agents express the opinion that this new discovery is of such a superior and masterly character that the probability is it will lead to a productive and permanently valuable mine. West Chiverton, 16 to 17; West Frances, 7 to 7 1/2; West Seton, 31 to 33.

At the Great Retailack meeting, on Wednesday, a dividend of 1s. 6d. per share was declared. The accounts show assets over liabilities of 534l. 4s. 3d. At the last meeting, held in December, there was a balance against the company of 94l. 12s. The blends since sold has been 562 tons, realising 1817l. 11s. 2d. Wheat Cny, 1 1/2 to 1 3/4; at the meeting, on Friday, a call of 3s. per share was made. The loss on the quarter's working amounted to 670l. The tin sold amounted to 80 tons, which brought on an average 42l. 5s. per ton. Botallack, 40 to 50; at the meeting the accounts showed a loss on the quarter's working of 705l., and a debit balance of 2304l. The tin credited at 3750l. was in reality stocked at 42l. for a better price. Killfret, 17s. to 19s.; at the meeting the accounts showed a loss of 475l. in the four months' working, and a debit balance of 1765l. A call of 3s. per share was made. The mine is looking well, and great expectations formed in regard to cutting the lode at the 52. West Tolgus, 62 to 64; Wheal Agar, 2 1/2 to 3; Wheal Crebor, 2 to 2 1/2. Glenroy shares have been largely dealt in at 6 1/2 to 7; it is in 2000 shares of 4l. each, fully paid up, and until lately was part of Great Laxey Mine, and held under the same lease. It is now under a new lease at 1-12th royalty. The lode has been cut in three places, worth 80l. per fathom each, and as the mine is likely to cause great sensation we may refer to it more particularly next week.

Almada and Tirito, 4 to 4 1/2; Argentine, 6 to 6 1/2; Eberhardt and Aurora, 7 1/2 to 8; Flagstaff, 2 1/2 to 2 3/4; Frontino, 2 1/2 to 2 3/4. St. John del Rey, 340 to 360; the profit for the month of April was 9100l. The produce for the 10 days' division of May—12,000 oits.—4650l. Javal, 6s. to 8s.; I.X.L., 1 to 1 1/2; Exchequer, 1 1/2 to 2 1/2; Richmond, 7 1/2 to 8; San Pedro, 1 1/2 to 2; Sweetland, 1 1/2 to 1 3/4; Santa Barbara, 1 1/2 to 2; Condes of Chili, 6 to 6 1/2; the manager's report is very satisfactory. The Isolina Mine, he says, will easily produce 300 tons per month. The ore in sight he estimates at 2000 to 3000 tons. Some of the stuff from the bottom produces 55 oza. of silver to the ton.

The Market for Mine Shares on the Stock Exchange during the week has presented a marked contrast to the semi-panic observable in all other stock markets. General activity and advancing values have been the prominent features, the volume of business daily transacted being upon a considerably larger scale than for some time past. Copper steady; the advance in tin well supported, the higher quotation having been paid for forward delivery. Lead unchanged, and spelter again easier.

Exchequer have been largely dealt in, but without material quotable change, closing 1 1/2 to 2 1/2; the 200 ft. level has again struck very rich ore, one vein being 2 in. and the other parallel 12 in. wide; at this point another stope has been commenced, and from it a rich stone of silver ore was taken, and forwarded to London; those experienced in this class of ore estimate it will yield upon assay silver of the value of 300l. per ton. Another important feature in the latest advances is that the tunnel driving upon the Accacia lode has struck water—this lode is in the northern extension of the I.X.L. Mine; this tunnel is also approaching the junction of the I.X.L. with the Exchequer lode; the manager was leaving on May 6 for Peavine, so as to see the working of the O'Hara furnace, and make his own test of its chlorinising capabilities before erecting it. I.X.L., 1 to 1 1/2; it is anticipated definite accounts will be received next week from the manager with reference to the property and the purchase of the mill; the tunnel the Exchequer Company is driving on the Accacia lode proves to a certain extent the northern portion of I.X.L., which it crosses at different points, and at each junction there are heavy outcrops, always indicative of wealth below.

Flagstaff have advanced, and close 2 1/2; Professor Vincent, F.R.S., has returned from America, after having made a thorough inspection of the mine; it appears the Professor has had a satisfactory interview with Mr. Davis, in New York, and states that the produce of the mine during the last six months has been such that the floating debt has been reduced by 20,000l., and that there are large quantities of ore in sight, which are now being mined and smelted. As soon as Professor Vincent is able to make his detailed report, a copy will be forwarded to the shareholders and a general meeting called. Emma, 1 to 1 1/2; the Committee for Foreign Affairs represent that General Schenck had placed himself in a false position through identifying himself with a private enterprise; the House condemns the action as ill-advised, unfortunate, and incompatible with the duties of his official position. Condes of Chili, 6 to 6 1/2; a cablegram has been received from Capt. Secombe giving full confirmation of the value and capabilities of this property, and further, that regular shipments of ore can be continued throughout the year. One of the lodes is estimated to yield 300 tons per month, leaving a profit of about 3000l. The first shipment is due in a few days. Chicago, 5 to 6 1/2; a payment on account of dividend of 4s. per share has been declared, payable on May 31, and 2000l. is to be repaid pro rata to those debenture holders who desire re-payment. These debentures were issued in June last, under a resolution of a general meeting, to raise 30,000l. on debentures for the purchase of the Flavilla Mine. The present payment will reduce the amount due on debentures to 5160l.

Richmond Consolidated, 7 1/2 to 8. Cablegram received:—"Week's run, \$30,000; started third furnace; mine looking well." As the third furnace is now at work, it may be inferred that the main engine is completed, as the auxiliary engine was not able to furnish blast for three furnaces. The supply of charcoal appears to be sufficiently abundant to allow of selecting the best quality. By the last published accounts the advances made by this billion agent amounted to 127,027l. 15s. This, it is understood, has been paid, and that the balance is now in favour of the company. A letter

They have established Corresponding Agencies in all the principal towns of the United Kingdom, and are prepared to deal in the various local Stocks and Shares at close prices. Orders per post or telegraph receive prompt attention.

INVESTORS SHOULD APPLY for a copy of Messrs. W. J. TALLENTIRE and Co.'s Circular, SENT POST FREE. It contains valuable information on Foreign Stocks (especially South American, Mexican, and Turkish), Railways, and Iron Mines.

Notices to Correspondents.

* Much inconvenience having arisen in consequence of several of the Numbers during the past year being out of print, we recommend that the Journal should be held on receipt; it then forms an accumulating useful work of reference.

PRACTICAL ASSAYING—“*Mine Agent*” (Liskeard).—The best work on this subject is, probably, Crookes's edition of Mitchell's Assaying, published by Longmans, at about 2s. There are some cheap works on the subject, but they cannot be recommended.

COMPRESSED AIR LOCOMOTIVES—“*R. A.*”—These engines have not been practically used on railways, and from their bulk are unlikely to be so used. Those used at the St. Gothard Tunnel are about 25 ft. or 30 ft. long, and except that the power for compressing the air is obtained for nothing from the Reuss torrent, which runs by the Goeschene mouth, and from another torrent on the Alpi side, they would be too expensive to use. Compressed air power produced with steam-engines is only applicable for underground work.

MR. GEORGE HENWOOD'S notices on the Lead Mines of the Wearlale and Teesdale districts will appear in next week's Journal.

SHARE DEALING.—We never interfere in the sale or purchase of shares; neither do we recommend any particular mine for investment or speculation, or broker through whom business should be transacted. The addresses of most of the latter appear in our advertising columns.

RECEIVED.—“*Ferro Manganes*.” We shall be glad of particulars—“*M. W.*”—“*Enquirer*” (Shropshire)—“*E. D. J.*” (Bognor). Next week—“*Shareholder*” (Wheat Uny) should write to the secretary—“*E. R. B.*”—“*M. C. E.*”—“*T. C.*”—“*H. Sewell* (Peru). Next week—“*W. S. R.*”—“*W. M.*” (Dublin)—“*Reader*” (Chester).

THE MINING JOURNAL,

Railway and Commercial Gazette.

LONDON, MAY 27, 1876.

EMPLOYERS' LIABILITY FOR INJURY BILL.

Both masters and workmen may well be congratulated upon the result of the debate upon this Bill in the House of Commons, on Wednesday, since the exaggerated and unwarrantable statements made by Mr. MACDONALD have been completely refuted, whilst the evil long recognised which justified him in proposing some legislation on the subject will now be removed; it has also elicited the important statement from Mr. BURN that “there was a very erroneous impression as to the wages earned by miners a few years ago, the average being not more than 2l. 10s. per week,” which proves that by paying a higher rate of wages than is given for any other class of unskilled labour the masters have already admitted the miners' occupation to be attended by more than common danger, and compensated them accordingly. The general opinion of the House appeared to be that the measure might possibly remove one evil, but would certainly create a much greater one, and one, moreover, infinitely more difficult to deal with. Mr. MACDONALD was, no doubt, at great disadvantage in having to represent the views of a small proportion of one class of labourers, and those, too, decidedly not the best educated—hence his speech was better calculated to influence the minds of those he spoke for than of those he addressed; for, in declaring that “every explosion is a crime, and those who permit a state of things to exist that will enable one to be possible are virtually guilty of a crime,” not only did he state that which is not true, but he showed that he was ignoring facts which, claiming to have actually worked in a mine, he must have been well acquainted with.

But the entire question was at once reduced to its true position by the explanations of the Attorney-General, who pointed out that it was essentially a legal one, and then stated what the actual state of the law on the subject was. He remarked that Mr. MACDONALD had with perfect accuracy said that the owners of mines were bound to keep their mines free from explosive gases, and that if the mines were altogether free from such gases no explosion could occur, and he could not see anything in the Bill which would impose upon them any additional liability in that direction. As the law now stood an employer was liable for the consequences of the acts of his servant to his last farthing as far as they affected a person who was not in his employment, and, indeed, his liability was so great as, in the view of some persons, to amount to absolute injustice. The Attorney-General also cautioned the House not to suppose that the servants of employers were altogether without protection. A master was, in the first place, bound to see that the machinery employed in the business in which his servants were engaged was suitable for the purpose. If the machinery was defective, or rotten, or unfenced where it ought to be fenced he would be liable for all the consequences of his neglect. He was bound to take every reasonable care to ensure that proper and fit servants were engaged for his workmen. The question was whether the liability of the master should be carried still further. What the Bill proposed was this—that whenever an accident happened to a person in the employ of a master not in consequence of any neglect on the part of the master to obey the requirements of an Act of Parliament or to ensure the engagement of competent servants, but in consequence of the negligence of a fellow-servant, the master should be liable for the damages which ensued. Was that, he asked, reasonable? As far as he (the Attorney-General) could discover, the only way in which the law operated with severity upon the workman was this—that it was very difficult for the Courts to define what was a common employment. Servants were often prevented, as the law now stood, from obtaining compensation for an accident which happened through the default of a man who could not be regarded as being in the position of a fellow-servant. For example, an accident might happen through the negligence of an overlooker or a manager, who was practically in the position of the master himself. As the law now stood, a servant in such a case might be unable to obtain compensation, as the overlooker or manager might be regarded as being in the position of a fellow-servant. He did not say that the matter was clear, because he knew there were *dicta* the other way, but there had been decisions which would go to that extent. Now, that to his mind was a hard-ship, and it would be well if that hardship were removed. The design of the Bill was to introduce a most sweeping alteration in the law, which to his mind would work great injustice, and as the Bill would establish a mischievous principle he hoped the House would not allow it to be read a second time.

The importance of the question was not denied by anyone who took part in the debate, but there was almost equal unanimity as to the Bill being unlikely to meet the difficulty, owing to its being drawn by those most imperfectly acquainted with the general requirements of the case, and who, moreover, from their very position, were unable to consider the matter with that amount of impartiality necessary to ensure success. Perhaps the best speech in the debate was that of Mr. KNOWLES, of Wigan, who has been connected all his life with mines, and is exceedingly popular with his workmen. He remarked that he would support any measure the object of which was the welfare of the working classes, having been connected with them for many years. The hon. member for Stafford professed to speak as a practical man; but if his remarks were intended to illustrate his practical knowledge he knew very little. The case quoted by the hon. member occurred before the passing of the Mines Regulation Act. From his practical knowledge the hon. member declared that where there was no gas there could be no explosion, but in a mine which was as free of gas as that House, and with regard to which every care that human ingenuity could suggest was taken, the first stroke of the pick might liberate a great deal of gas. Did the hon. member tell the House that when that gas showed itself the men ceased working? The men were the first to observe danger, and they knew where to find it. He could teach hon. members in ten minutes where to find the danger. (A laugh.) The hon. member laughed, but was his practical knowledge sufficient to enable him to say whether the statement was right or wrong? Only a practical man could find out where the danger was. As to the question of responsibility, take the case of two men engaged in repairing a shaft. Every care was taken to provide good material and proper arrangements for the work, but, after all, one of the men

fell off the scaffolding. Was the master responsible for that? Surely the master was not to stand there while they were doing the work. Again, as to accidents in coal mines. If six men were working, one being engaged in bringing the coal down, and the others engaged in front of it, and the one brought the coal down without giving the others notice, and injured them, was the master responsible? They always would have accidents, they could not obviate them altogether. The last Mines Bill was very stringent; so stringent as to be almost mischievous. He had an accident in one of his collieries, which showed what gas would do and how it would act. He knew it was a fiery mine, and he worked it as such. He provided five times the ventilation absolutely required, but an accident occurred there, killing a large number of men. That accident cost him, besides 100,000l., the lives of probably the best men he ever employed. In fact, he would never be able to replace them. They were of the old stamp of colliers, not the new stamp, who could not do half the work of the old class of men. He had lived long enough to know that those masters were most successful who took the greatest care of their men. He would go so far as to say that men ought to have good wages, they ought to be well fed, well clothed, and well housed, for he would the collier or the ironworker, for instance, work well if he were not well fed and well rested? Would this Bill do that? No; it would encourage nothing but carelessness and idleness. They had many societies in operation in the North of England to redress the sufferings occasioned by accidents and in other ways. Did they find the hon. member encourage these provisions? The societies to which he referred devoted their money to good objects, and did not allow it to be frittered away in encouraging strikes and paid agitators. By the contribution of merely 3d. per week by the men in the great mining districts of the North compensation was provided for injuries, the masters subscribing 20 per cent., and if there were added to this what they had to pay in poor rate very ample provision indeed would be made. While, however, the societies were successful in Lancashire, Northumberland, and Durham, a society in North Staffordshire had not been successful, for after being in operation for six years the number of members did not reach 1000. What influences had been at work in North Staffordshire he could not say, but it was time the colliers should judge and act for themselves. Instead of introducing this Bill he would suggest the hon. member should give workmen good advice—advice that they were responsible beings; for if they were to pass Bills of this kind it might well be thought that the working classes were either children, slaves, or something worse.

The view entertained by Mr. SHAW LEFFREY was probably the correct one—that those interested in the Bill did not desire to go the full length of it, and this was concurred in by Sir E. WILMOT, who admitted that the Bill went further than expedient, although the state of the law on the subject is evidently imperfect. Mr. PEASE thought the Bill would tend to reduce wages, and that its effect would probably be the very reverse of that desired by those introducing it—the saving of life among the workmen. That servants have sometimes had difficulty in obtaining compensation for injuries although justly entitled to it must be acknowledged, but as Mr. TENNANT remarked the grievance arose less from the principle of law than from the interpretation put upon it by the judges by holding, for example, that a foreman of works exercising authority over the men was in law a fellow-workman, for whose acts the employer was not responsible. What really seems to be required is that the recognition of common employment should be limited to workmen employed in the same kind of work, but that any superior workmen or officer authorised to give such directions as to the general execution of the work as will affect the safety of the workmen generally shall be regarded as standing in the position of the master's agent, and not as a fellow-workman; it must also be provided that common employment shall not be recognised unless the occupations of the workman injured and of him causing the accident be similar. And as to the compensation, care should be taken to prevent any award being made if it can be proved by those charged with negligence that they have taken all reasonable precautions to ensure safety.

THE FACTORY AND WORKSHOPS COMMISSION.

The report which has just been issued by the Royal Commission charged to enquire into the working and operation of the Factory and Workshops Act of 1874 has once more brought prominently before the public mind the paternal regard which Government professes to have for the welfare of the rising generation. We should be the last to contend that it is not the imperative duty of the State to protect the lives and the health of those who cannot help themselves, nor can we ignore the fact that there are instances where the greed or ignorance of the parents drive children at too early an age into unhealthy occupations, which it is right should be prevented. But whilst willingly admitting such to be the case, we are equally desirous that the action of the Government should not unnecessarily curb and interfere with the very foundation of our prosperity—the productive power of the nation—at a time when we have hard battles to fight in order to maintain our supremacy amongst the other nations of the world.

The opposition with which the Factory Acts, and afterwards the Workshops Act, were first greeted has to a great extent died out in the general desire on the part of large manufacturers to give it a fair practical test, and the Inspectors now report that the regulations of those Acts are carried out with cordiality by the great majority of employers. Probably the Acts were conceived in a beneficent spirit, and passed by the Legislature with the very best possible object, but no one can deny that there are many anomalies in the Acts, and that many of their rules and clauses sadly need amendment. We believe, also, that for several years past there has been too great a tendency on the part of both Conservative and Liberal Governments to pamper the working classes, which has fostered a spirit of discontent and also insubordination, and has tended in no small degree to the promotion and growth of those various gigantic Trades Unions which have been, and still are, so inimical to the best interests of this nation in a commercial and manufacturing point of view. In the report which the Royal Commissioners have recently presented they make various important recommendations, the great majority of which unquestionably tend to increase the responsibility of employers, and we fear will operate prejudicially to the manufacturers in more respects than one unless materially modified. The Factory Acts (1833 to 1874), the Roper-makers Act (1846), the Lace Factory Acts (1861), and the Workshops Acts (1866 to 1871), are to be consolidated into a single Act, subject to these amendments—“*Workshops*” should be made “*factories*”—that is, the Workshops Act (1867) should be repealed, and the limitation in definition of a workshop to places where the handicraft is carried on by any child, young person, or woman, should be extended to all factories. The report then deals with the proposed extension of the Factories Acts, stating that the places of work should be defined in the Consolidated Act to include places in the “*open air*,” but mines, underground quarries worked by shafts, and quarries or pit banks connected with a mine should be exempt. Alluding to the general regulation of hours of work, the report recommends that the limits of hours for labour should be in all factories 6 A.M. to 6 P.M., 6:30 A.M. to 6:30 P.M., or 7 A.M. to 7 P.M. all the year round. Of these hours two are to be reserved for meals in factories and one and a half in workshops, so that ten and a half hours labour per diem is the limit, except in special cases where relaxation may be granted by the Secretary of State. All Sunday work is recommended to be prohibited in both factories and workshops, except where specially allowed by the Secretary of State. With regard to the important matter of education, the Royal Commissioners suggest that the attendance of all children at school, whether at work or not, should be enforced by law, the school age being from 5 to 13 years, but “*half-time*” attendance should be conceded as a privilege to all children beneficially and necessarily employed; and all children employed according to the Consolidated Act are to be deemed so beneficially employed. In no case shall a child be allowed to attend half-time under 10 years of age, or be permitted to work under the Consolidated Act.

Such are the principal recommendations which the Royal Commissioners have made in the report which they have recently pre-

sented; and, as we have already inferred, the great object appears to be the very laudable and praiseworthy one of protecting the health and comfort of the children of the working classes and the manufacturing and mining population. We suppose this is the legitimate intention of the Government, and if some factories and workshops will find under the new regulations still more difficulty than at present to obtain boy labour, and if some parents are doomed to see their strong, hearty boys kept at school when they could be profitably engaged at some easy work, and thus adding a few shillings weekly to the scanty purse, they must submit to the powers that be, in the times. Nobody can question the fact that our miners, for instance, need very much more education than they have hitherto had, not even at present receive; but this education should not simply be that contained within the limits of the three R's—“*reading, writing, and arithmetic*”—but should be of a technical character, which which they have to perform. Again, it is no use for us longer to doubt the very superior education which the working classes of many of the continental nations receive, as contrasted with that of which has hitherto been obtained in England. The very powerful America, now brings to bear in the production of the vast majority of our fabrics, as well as in the make of iron, of engines, and in the thousands of articles of which we at one time had almost a monopoly, is due to that comprehensive system of instruction which runs through every department. We should all recognise the value of education, more especially technical instruction, if we would still keep our place amongst the leading productive nations of the world, for no man, no matter how low in the working or manufacturing scale, but becomes a better workman proportionate to his education. Let us hope that this is the basis upon which the recommendations of the Royal Commissioners of the Factory and Workshops Act are built, and as such give it support. There are, doubtless, an analysis and inconsistencies which will have to be modified in the practical application of the Act, but as the great object is the education of the mind and the promotion of the physical health of the working classes, good must eventually spring therefrom; and if some plan could be devised by which a comprehensive technical education could be afforded all branches of our industrial population, England would still fearlessly contend with other nations in all those articles which constitute our prosperity and our greatness.

MINERALS UNDERLYING RAILWAYS.

In the Committee of the House of Commons to which the Great Western Railway Bill was referred an important issue relative to the minerals underlying railways was raised. The company by certain clauses sought to have provisions retained in their Bill which extended in Somersetshire, by which they would have compulsory power to purchase the minerals lying at a distance of 50 yards from the line of rails. This was opposed by a large number of owners, including the Duke of Beaufort, Lord Windsor, Lord DUNSTON, and the trustees of the late Marquis of Brixton, as well as the Somerset Coal Canal Company. It was stated on the part of the company that the powers asked for were for the purpose of giving additional protection at such places as the minerals were being worked in proximity to the railway. But it was, in fact, a bold attempt on the part of the Great Western Railway to get inserted in their Bill certain clauses that would override a general Act of Parliament. It would be placing a great power in the hands of the company, to the prejudice of mineral owners and railway proprietors, seeing that in some instances shafts are sunk close to lines of railways, for it is a great advantage for a mine to be situated as close as possible to the rails. The company, by the powers asked for, would in many instances be placed in a position to have so large an area of ground as to open out and work a large tract, seeing that they have found it advantageous to have one in South Wales for the supply of fuel to the locomotives. There would be great difficulties to be encountered in the purchase of minerals where they had not been opened and their value ascertained. On the part of the opponents of the Bill, it was pointed out that the Great Western was asking for powers not enjoyed by any other railway company, and that if they were granted it would be to the serious injury of mineral and mine owners.

To some extent the counsel for the Great Western admitted the force of the arguments against the Bill, for they shifted their ground, and altered the clauses most materially. They proposed that the minerals only should be taken so far as they were necessary for the support of the railway, canal, or other works belonging to the company. Still there were other advantages claimed by the company prejudicial to the mineral owners which were opposed along with the altered proposal. Mineowners were not to be allowed to work within a certain distance of the railway until they had given notice to the company that they were about to do so, but notice should not be given until the workings had reached within 40 yards of the railway. This was asking for what may be termed extra mining, and something like contradictory powers on the part of the Great Western, the directors of which thought that they could obtain a private Bill what they had not in the general Act, by which a railway company could not restrain a mineowner from continuing to approach a line on the ground of danger to the railway, but only when such continued working involved danger to the mine itself. It may be said that the existing law has been found to work very well, and there certainly does not appear any substantial reason why the Great Western should be given exceptional powers. We show that a change was really necessary, and equally advantageous to all the parties concerned, then the proper course would be to apply for an Act of Parliament that would be applicable to all railway companies. Such, we believe, was the opinion of the committee, who struck out the clauses objected to. The result shows the necessity there is for mineral owners noticing the Bill that may be brought from time to time by railway and other companies into the House of Commons, for it was stated that the Great Western had not given notice to any individual colliery of their intention to apply for the powers they sought in the Bill to which we have alluded.

THE AMERICAN IRON MANUFACTURE.

We have on several recent occasions called attention to the influence which the progress of American metallurgical industry has exerted upon the iron trade of Great Britain. We have seen the American demand for our rails, and hence business in the British rail-producing districts is reduced to an extremely languid state. Mr. SAMUELSON, M.P., one of the leading ironmasters of this country, has become so impressed with the metallurgical resources of Tennessee that he is reported in American journals to be about to commence the manufacture of iron in that State. If this is correct—and the statement certainly awaits authoritative confirmation at present—Mr. SAMUELSON would appear to have come to the conclusion that if British capital engaged in the British iron trade could secure reasonable remuneration in consequence of the increase in American competition, it must cross the Atlantic and profit from the abundant mineral resources of some of the American States. Whether Mr. SAMUELSON has really decided to embark or not in the manufacture of iron in Tennessee, there can be no doubt that the American trade has acquired very considerable importance, the American consumption of American rolled iron in 1874, as estimated by the American Iron Association, having been 1,839,560 tons, of which Pennsylvania made 708,000 tons, Ohio coming second with 229,370 tons. Of rails properly so-called Pennsylvania made in 1874 an aggregate of 259,243 tons, against 125,103 tons made in Illinois, which figures in the list of States in the next largest rail producer. The supremacy achieved by Pennsylvania in the production of raw and manufactured iron is conclusively established by the fact that in 1874 Pennsylvania made altogether one-third of all the rails produced in the American Republic. If any lingering doubt were still entertained as to the metallurgical superiority of Pennsylvania, it would be finally set at rest by the fact that in 1874 Pennsylvania made 463,730 tons of other descriptions of rolled iron, while Ohio, which again figured second in the list, made

Several branches of the Sheffield Trade are very quiet, and the men only partially employed. In some few instances there has been a shortness of manufacturing fuel, but supplies fully equal to the requirements have been received from Staffordshire. The men in South Yorkshire have been offered the 12½ per cent. terms, but have refused them. At several places they go out daily with a wagon drawn by men for the purpose of collecting anything in the shape of provisions that may be offered them, as well as money. It is evident that many of the younger hands are becoming thoroughly demoralised, and rather enjoy the excursions made, so that they are not likely to go to work so long as they can get sufficient to eat, which most of them evidently manage to do. The Managers Main Company has published a statement showing the wages paid to the getters for one week. It may be presumed that the amount includes not only the getter but the hurrier as well, and it appears that no less than 24 obtained wages varying from 10s. to 28s. per day of eight hours. It must certainly be a serious matter for some of those men who have only been making their 5s. or 6s. a week to submit to a reduction of 12½ per cent., for then they would only have some 4s. or 5s. to live on for a week. In some mining districts the men are only receiving 3s. 6d. per day, and they have been appealed to for the support of some of those who have been making five or six times the amount. Comment is unnecessary.

May 25.—When we last wrote no one anticipated—unless, indeed, the smelters, who kept their secret well—that there would have been so substantial and rapid a change in the fortunes of our tin mines. We have upon several occasions expressed our belief that the lowest point had been reached, and had pointed out reasons for holding that an improvement was apparently not far distant; but still the announcement when it came took most people by surprise. The Cornish mining interest has fallen upon days in which it is grateful for small mercies, and a rise of 2*l.* would be hailed with joy. How much more, then, one of 4*l.* That the advance should have taken place in the face of a continued depression in the general business affairs of the country fully proves the accuracy of the forecasts which had been made, and indicates very clearly that that which was believed to be the lowest point below which remunerative production, either in Cornwall nor anywhere else, could not go was really reached. Here, then, we have a basis for future calculations which should prove of value. We now know, it would seem, the possible worst, and should shape our course accordingly.

The prospects of the future appear decidedly good. There does not seem to be much fear of the market being swamped by excessive foreign competition, and as to Cornwall, we take it there is no particular danger there. Several tin mines have been stopped, and those which remain have been working at too high pressure, returning all the tin possible to enable them to meet costs to be able to materially increase their output. It may be asked—"What of the tin stocked at Wheal Owles, Botallack, and elsewhere?" We do not anticipate any difficulty here. Those who have pluckily held on so long are not likely to flood the market and spoil their own waiting game, and it is clear that the demand is steadily increasing. In five years time, if manganese bronze comes at all into the favour it deserves, what with this and what with the other uses for the metal rapidly opening up, we should not be at all surprised to see the demand increase 40 or 50 per cent. Some increase is certain, and the chances are it will be substantial.

The extreme insensitiveness of the Cornish share market has been chiefly shown in the rise of prices which has followed on the rise in the standards. Early in the year we pointed out what awaited the plucky speculators, and already a very substantial slice of good fortune has been realised. We are hardly likely, however, to see a furor. And it is well we should not. What we want just now is less the increase in the number of our tin mines as the proper working of those which exist.

The reasons which induce us to say this with regard to tin mines do not apply to copper, and it is gratifying to find that the revival in this special branch of mining industry continues. If the copper mines of Cornwall are not as good as ever—and that cannot be, seeing the immense wealth they have produced—there is an enormous quantity of copper as yet to be won. There is a good deal of nonsense written and spoken concerning the "old men," to the disparagement of the modern miners, and they are credited with having an almost supernatural ability in finding out good mines. The truth is they were no better than other folks, and in their way made quite as many blunders, though with so much untouched mineral ground they had less excuse for them. Only the memory of their successes now remains, and hasty-minded people come to the conclusion that they never did anything else.

The calamitous explosion at the Herodotus Powder Works, referred to in last week's Journal, was made the subject of a stringent enquiry by a coroner's jury, in the presence of Major Majendie, Government Inspector of Explosives. The jury returned a verdict of accidental death, and the Inspector highly complimented the company on the excellence of their management and the completeness of their precautions against disaster.

Messrs. William Brunton & Co., of Penhallick Safety Fuse Works, near Redruth, have been fortunate enough to obtain the only medal for safety fuse explosives at the International Exhibition of Chili. The medal is accompanied with a very beautiful engraving embodying the name of the firm, and signed by the President, and countersigned by the Director-General. Considering the great competition in this manufacture the firm of Brunton and Co. are to be congratulated on their great success and the energy displayed in competing in the foreign international exhibitions.

The action recently brought in the Redruth County Court, by Mr. W. H. Rule, of Camborne, against Mr. T. M. Hawke, of St. Day, is one of considerable importance to those engaged in mine share dealing. Rule, although holding no West Poldice shares, gave Hawke 5*l*. for the "put" (that is, the right to sell to Hawke or not, as Rule pleased) of five shares for 25*l*. at the end of the month (February) and the shares having fallen to an nominal price in the meantime, Hawke declined to accept transfer when tendered by Rule, who had purchased shares of a third party—a fact which did not affect the bargain. Rule sold the shares against Hawke by auction through Mr. J. Thomas, of Redruth, and alleged that he lost 15*l*. by the transaction. This amount Rule sought to recover, but the judge doubted whether it was a contract that could be maintained in a court of law; he was inclined to think it was not, but deferred his judgment until the next Court day. The result will be interesting, especially as there can be no question that if these gambling transactions can be put to a stop it will be of enormous benefit to legitimate mining enterprise.

May 25.—There has been a material change in the state of affairs since my last notice, for some thousands of miners are once more at work. Staveley and Clay Cross have taken the initiative, and others are likely to follow. Those that are out, along with their families have already suffered a good deal, for the Union has been unable to find money to give the strike pay to which the members are entitled. The National Association has made an appeal to the Trades Union in all parts of the country to render assistance to the miners now on strike. Why this should be necessary has not transpired, for it was generally understood that the Association could find almost any amount of money for the support of a strike, one of the rules being that where the members agreed to submit any matter in dispute to arbitration, and the same is refused by the masters, the former shall be entitled to a certain sum weekly. Now, many of the men have been out for several weeks, yet no money has been received from the National Association. The consequence has been that they have now to go about the towns and villages in droves, begging on all sides. The Association, it may be said, is presided over by Mr. MacDonald, M.P., who is fond of showing what he has done towards elevating the miners and raising them in the social scale. But most people will be inclined to believe that the men and their families being turned into beggars is not exactly the right way of elevating

the mining body. It may be said that the men are only striking against a reduction of 2½ per cent., having agreed to concede 10 per cent. from the gross earnings. The masters, on the other hand, have agreed to take 12½ instead of 15 per cent. The question in dispute then, is merely one of 6d. in 17. Should it be accepted, the miner will then be the best paid of any similar body in the kingdom, and this is a great many of them know. Such being the case, it does appear unfair, to say the least, to ask support from those men who are now in receipt of 25 per cent. less wages than the South Yorkshire and North Derbyshire miners will be should they go in at the 12½ per cent. As to trade, it may be said that an increased tonnage has been forwarded to London and the South, but prices have not changed, there being an abundance of coal to be had. The North Country colliery owners have recently reduced their prices, and this must seriously affect the inland coal, so far at least as the London market is concerned. The Iron Trade in Derbyshire is very much as it has been for some time past, work being more steady than active.

only 110,556 tons. The Keystone State, as Pennsylvania is sometimes called, has indeed taken the lead of all her neighbours in the by no means unimportant matter of coal and iron.

At the same time, it must not be supposed for a moment that Pennsylvania possesses a monopoly of the iron deposits of the United States. Vast deposits, like those of Lake Superior, Lake Champlain, the Missouri Iron Mountain, the Catskills, and the Cornwall region occur only at rare intervals; but fossil ores extend in a thin sheet from Lake Ontario, through Pennsylvania and Virginia to Tennessee; from Lake Ontario are also found, but not in great masses, through New Jersey and New York, and hematites are met with almost everywhere. Still, it is the Keystone State which is emphatically the iron State. Of the 713 blast-furnaces existing in the United States in January of this year Pennsylvania possessed 279, while in no other State were there even half so many. Thus, Ohio ranked second, with 99 further; New York third, with 57 furnaces; and Michigan and Virginia fourth, with 34 furnaces each. At the same date, it may be added that the United States had 332 rolling-mills—137 in Pennsylvania, 46 in Ohio, 23 in New York, and 22 in Massachusetts, &c. The aggregate amount of pig-iron which was made in the United States in 1874 was 2,639,413 tons, the production of Pennsylvania figuring in this total for 1,163,133 tons, leaving the production of all the other American pig-iron making States at 1,476,280 tons. The only other State which can fairly be said to be an important centre of metallurgical industry is, indeed, Ohio, which made 425,001 tons of pig in 1874, 409,029 tons in 1873, and 399,743 tons in 1872. It will be seen that all the details which we have been summarising relate to 1874; the figures for 1875 will, when they come to be analysed, exhibit substantially the same results. If such progress has been achieved by the iron trade of the United States in presence of depressing conditions, it may be fairly expected that when American trade and enterprise, which have been in a bad way since September, 1873, begin to revive again, the American iron manufacture will experience a further decided impetus, and will attain still greater importance.

THE ABSENCE OF JOINT-STOCK ENTERPRISE.—It is plainly evidenced, by the almost entire absence of joint-stock enterprise from the columns of the newspapers, as well as by the marked falling off in the number of new companies registered from time to time, that the joint-stock movement is in abeyance, and that one of the principal channels for the employment of capital is practically closed. This is a matter for regret, although it is scarcely one for surprise. The existing laws which govern the proceedings of joint-stock companies are a failure, and until some remedy is introduced, in the shape of a revision of the Joint-Stock Companies Acts, no marked revival of joint-stock enterprise, nor any restoration of public confidence, can be looked for. Although the number of mining companies registered of late is not much below the usual average, this form of enterprise has suffered in conjunction with other departments of industry, and the public are apathetic upon the subject of new ventures. Now that there is some change in the official arrangements of the Registration Office, and the control of this department of the public service is in the hands of the Inland Revenue, there is, perhaps, some chance of a reorganisation of the whole system, and a thorough re-modelling of the existing code. Some alteration is necessary, in the interest of investors and the public generally.

MWYNIDY IRON ORE COMPANY.—The company has at length acquired the base of the Llwyn Sner property, which adjoins the eastern end of the Mwynidy Mines. This acquisition will enable the company to continue their mining operations at the eastern end of the mines, and thence into Llwyn Sner without interruption, and at present without additional expenditure either in shafts or machinery. At the Treacastle property an engine-shaft has been sunk to a depth of the discovered ore, as proved by the Diamond boring machines, and a level has been driven at 36 fms. below the surface and the ore has there been found of very good quality.

HOMOGENEOUS IRON RAILS.—The North-Eastern Railway Company are now engaged in experiments upon a large scale under the superintendence of Mr. I. Lowthian Bell, M.P., the eminent ironmaster, for making homogeneous iron rails from Cleveland pig and which, so far as they have gone, are highly encouraging. Should the result as is very confidently anticipated, the advantage to the Cleveland district must be very great.

SALE OF CHILIAN MINE SHARES.—The sale of three barras in the property of the Curizillalo Mining Company, announced in last week's *Miner's Journal*, took place on Tuesday at the Auction Mart, T. Kenyon-ward, and Mr. Robert C. Driver, of Whitehall (the auctioneer), pointed out the many advantages of the property very minutely. The profits, as shown by the accounts already published have been at the rate of 2000*l.* per share per annum for several years past, the property being at present in thorough going order and likely to continue equally profitable for many years to come. To run any now in course of construction is all that appears necessary to make the plant complete. All outlay hitherto made has been paid out of revenue, and not more than 150*l.* per share is required to finish it. The sale was largely attended, but the bid for the first share was only 1000*l.* to commence with, a rather spirited bidding raising the amount to 6000*l.*—which, as the auctioneer remarked, was but three years' purchase—and at this it was knocked down. No higher bid could be obtained for the other two shares all three being purchased by the same gentleman, who was understood to be already the holder of 16 barras in the company.

MINERS' SAFETY-LAMP.—It is satisfactory to learn that Colonel Baker, who has for some months past been giving his attention to the improvement of the light-giving power of miners' safety-lamps, has at last produced one which has proved most satisfactory. Having long occupied the position of Chairman of the Cradock and Swansea Colliery Company, he must have acquired much practical knowledge as to what is required underground, and he could scarcely have turned it to better account than in devising a means of making underground operations more agreeable to miners.

NOVA SCOTIA COALS.—The recently published report of the Government Inspector of Mines—Mr. H. S. Poole—contains an interesting table, giving the composition of the principal Nova Scotia coals, the authorities for the analyses being the Manhattan and Imperial Gas Companies, Dawson, Chandler, How, Percy, Harrington and others. The coals appear to be of fair quality, although requiring some care in selection, according to the purposes for which they are required, as some have a larger percentage of ash, whilst others have too much sulphur to be pleasant. Among the better coals are those from the Black or Eleven-foot seam, which have from 60 to 65 per cent. of fixed carbon, 4 to 4½ of ash, and ½ per cent. of sulphur. The Lingan coals stand very high, as do the Sydney Main, Albion Deep, McGregor (another heavy in ash), Hub (some rather sulphury, but much excellent), Emery, Acadia, Albion Main and few others. Some additional care in picking the coals would doubtless increase the reputation of most kinds of Nova Scotia coals, and by securing a larger market might lead to more attention being paid to the general mining resources of the province.

COAL AND IRON IN THE UNITED STATES.—English rails are now so generally quoted upon the New York market, the transaction therein having become comparatively insignificant. No. 1 American iron is reported at \$22 to \$23 per ton, No. 2 ditto at \$20 to \$21 per ton, and American rails at the works at \$10 to \$15 per ton, all in currency. The total production of anthracite coal in Pennsylvania in April 29 this year amounted to 4,555,356 tons, against 4,370,023 tons in the corresponding period of 1875. The total production of bituminous coal in Pennsylvania to April 29 this year was 6,695,523 tons, against 9,014,407 tons in the corresponding period of 1875. The latest report of the American Iron and Steel Association returns the number of blast-furnaces in the United States on Jan. 1, 1877, at 713; of this total 279 furnaces were in Pennsylvania. Mr. Samuel M. P., the well-known English ironmaster is stated to be contemplating the establishment of a branch of his house in Tennessee. Coal is now being shipped from Seattle, the coal port of

May 25.—Little of an encouraging nature has occurred as to our trades of coal and iron since our last communication; indeed, if anything, matters are worse as it respects iron, and as to coal there is scarcely any appreciable difference. The men at Parkend opposed the reduction of wages, notwithstanding the alternative intimated—blowing out the furnaces. Mr. E. Crawshaw has now decided to go on another month, in the expressed hope of a change of prices, which may warrant further development of business. The Great Western Iron Company has also abandoned the intention, for the present at least, of blowing out any policy. At Cinderford the dispute is unsettled, the men decide to work on their willingness to work on the present scale, but if the strike while trade necessity lasts, to work only four days a week at present wages. The matter, one way or the other, will be settled by the end of this week, or such is the present expectation. They (the men) have already submitted to reductions to the extent of 4s. 6d. per week off wages, and say, with present prices of provisions and rent, that they find it difficult to live. Coal is now sold as low as 10s. per ton to the country trade at some pits, and is understood to be much about that figure to most clients. We regret to report that the water still rises at Trafalgar Colliery, which is a lamentable loss to the masters and men, as it, of course, reduces the output, because its actual forces out of employ gradually those who work in the deep. Some new attempt at starting companies have been made, though nothing has come to hand worth communicating to the public. The Severn and Wye Railway Company propose erecting a station near to Cinderford, but unless they come conveniently near we fear that disappointment may accrue. If they could do what we suggested—i.e., strike across Bilson Green direct for Gloucester—the inhabitants of the eastern side of the Forest of Dean would, we are persuaded, give them substantial

The Cotswold Naturalists' Club has just visited the remains of the old Roman road through the Forest, some very interesting remains, some 1800 years old, still remaining to be seen in a very good state of preservation near the hamlet of Sewdley. It is a pity that a portion should not be protected against further demolition for wall purposes, because few such antiquities are now to be met with in the United Kingdom.

May 25.—There has been no movement of importance in the Iron Trade since last report. Clearances continue slightly on the increase and Sweden has again been a good customer, as well as Italy. The home enquiry for miscellaneous qualities is rather better, but with this exception the demand is without change. At many of the works it is feared that when present orders are exhausted there will be long in coming to hand. At Rhymney one of the blast-furnaces has been blown out. To add to the depression which already exists in the Swansea district, it is stated that a number of hammermen and others have become idle at the steelworks, Landore, notices to terminate existing contracts having now become due. In the Tin-Plate Trade prospects do not improve—in fact, things have become rather worse, and depressed as business now is the recent rise in the price of tin will have a still further deleterious effect.

Of course the disturbed state of other coal-producing districts has had the effect of sending a few more orders into the hands of South Wales proprietors. The output at present, therefore, is somewhat considerable, and large shipments are made, the Mediterranean ports being credited as the destination of many cargoes. Prices are still extremely low. House qualities are unchanged. The depression of the trade has caused the stoppage of one of the collieries belonging to the Rhymney Iron Company. About 200 men will thus be thrown out of employ. Patent fuel is still a dull sale.

It will be remembered that at the time of the Risca colliery explosion, which occurred in the latter end of 1860, a considerable sum of money—some 5000*l.*—was collected for the widows and orphans of the killed. At the annual meeting of the committee appointed for the purpose of administering the fund it was shown by the accounts made up to the end of 1875 that there was a balance in hand of 1652*l.* 4*s.* There are now 15 recipients of the charity and the amount paid weekly is 2*l.* 15*s.*

Mr. T. G. Davies, late manager of the North and South Dundry Collieries, was presented with several costly articles, to the value of over £300., upon the occasion of his leaving the district to take a responsible situation in Bristol. The meeting at which the presentation was made was presided over by Mr. T. Curnew, of Butte Merthyr Colliery, who as well as several others spoke in high terms of the recipient.

The directors of the Great Western Colliery Company have just allotted the remainder of the 1500 new 20*l.* guaranteed 7 per cent shares. They say that good progress is being made with the erection of the machinery necessary for a large output of coal for each seam.

of the Manchester and Milford Railway Bill has been before the Select Committee of the House of Lords. The object sought by the Mid-Wales Railway Company was to obtain powers for the abandonment of the making of a line authorised by their Act of 1865. The company are unable for want of means to make the line. The Manchester and Milford Railway Company opposed on the ground that the Bill, if passed, would deprive them of a continuous line to Milford. Mr. Stansfeld, however, proposed that the company should be left with the burden of paying consistently to the Cambrian Company one-half of the cost of the joint line and one half the cost of the station. The Committee

The Bill of the London and North-Western Company for the transfer to them of the Sirhowy line has been before the Commons Committee, and the preamble has been declared carried, and there is but little doubt that the Bill will soon become law. It is proposed to double the line, and increased facilities for the conveyance of the mineral traffic of the district will thus be afforded.

A fatal accident has occurred at the Ferndale Upper Pit, near Pontypridd. Sinking operations are going on there, and a man was proceeding down the shaft to oil the pump, carrying a lighted candle in his hand, when an explosion of fire damp took place. Two persons were killed by the explosion, but the man who was the cause of it was not seriously injured. An inquest has been opened on the bodies, but has been adjourned.

The first general meeting of the Abercarnie and Newbridge Gas and Water Company has been held, and it was resolved to purchase a freehold site, and thereon erect works at a cost of 300*l*.

A strike which has lasted about six weeks has now come to a termination—the men working at the Hirrawood Colliery, belonging to the Aberdare Merthyr Steam Coal Company. They have agreed to resume work on the masters' terms.

At a meeting of the Aberdare Trades Council it has been agreed to vote the sum of £100 in aid of the strike fund, and an appeal to all the members was also agreed upon. A delegate from Yorkshire was present, and this was the result of his appeal. He has visited other parts of the district, and appears to have been pretty successful in obtaining subscribers.

The wages dispute at the Aber Colliery, Ogmore Valley, has been submitted to arbitration, but no decision has yet been arrived at. The question of determining the wages to be paid under the recent award of the conciliation board at Messrs Vivian's Morfa Colliery has been considered by Messrs. Lewis and Abraham, to whom it was referred, but no decision has yet been given in this case.

COTTON POWDER EXPERIMENTS IN SOUTH WALES.—Reference has several times been made in the *Mining Journal* to the safety of the cotton-powder manufactured by the Patent Cotton Gunpowder Company at Faversham, and during the past week an interesting series of experiments were made at Morfa, Taiabach, South Wales, under the superintendence of Mr. S. J. Mackie, C.E., to demonstrate the character of the material. First a single line of cartridges of 1 in. diameter was placed upon the iron casting forming an open charge, some sand being spread over the cartridges to keep them from being blown away. When all was in readiness the charge was ignited by means of a fuse, and a piece of iron was cut out into one plane of width of the iron casting, and varying from 3 to 6 in. in thickness. The next trial was a severe one, the charge being increased, and the powder inserted in a boss—where the thickness of the casting attained 11 in.—with additional cartridges on the top. The quantity of sand

used inside the boss was 1 lb., and a like quantity outside, and the effects produced clearly proved that a much smaller charge would have effectually broken up this portion of casting. The outside charge had to make its way through a plug of 3 in., and a tamping of sand 4 in. deep, and to reach the cartridges in the interior. The effect of this combined explosion was to break off a piece of heavy casting 13 inches broad, crack up another portion 13 inches by 5½ inches, cut off a cross bar 20 inches by 4 inches, and fling the end of the frame on to the tramway, a distance of 15 feet; this latter piece, weighing about 7 cwt., a fourth piece of iron, weighing about 56 lbs., was hurled into an adjoining field—a distance of 80 yards. A cartridge which had been placed in water a couple of hours previous was then taken out and exploded; its aquatic sojourn having had no deleterious effect upon its explosive properties. The next step was to remove a large portion of the casting which had been thrown over the rails by the force of the powder, and which four men failed to move. A charge of 10 cwt. speedily effected a removal, and broke the casting into four parts. Other parts of the casting were then broken up into convenient sizes, and most convincing proof was given of the powerful properties of cotton gunpowder as an explosive. Evidence was forthcoming also that apart from the detonator the cartridge will not explode; it will, however, ignite, give a clear flame until exhausted, but it is free from smoke or unpleasant vapour. Absolute proof of the non-explosive properties of the cotton powder have been furnished in a report by Prof. Atwood, before whom some experimenting was made, the result of which gave the railway companies confidence, and they consented to convey it over their lines, a concession not generally granted by the railway authorities. The most recent proof of an extraordinary kind as to its non-explosive properties was tendered in evidence at the inquest at Cymmer, on Thursday, and which deserves special attention. It was then stated by a witness that at the time of the explosion there was 16 lbs. of cotton powder in the same manholes as the dynamite, and this was picked up afterwards intact on the floor of the tunnel, but covered with mud and water.

TRADE OF THE TYNE AND WEAR.

May 25.—There is little change during the past week in the state of the Coal and Coke Trades here; although business cannot be considered brisk, a large amount of business has been done, and shipments of all good-class coals have been on a good scale. The prolonged strike in the Midlands has had a material effect on the fuel trade here. Steam coal is selling pretty well, at 12s. to 12s. 6d. for best qualities; gas coal from 7s. to 9s. per ton. Manufacturing coals are still a drug, and heavy coals are again very dull, and no improvement in the iron trade is looked for at present. The shipments foreign and coastwise have fallen off considerably of late. It is expected that the make will be largely reduced shortly; more furnaces have been put out, and arrangements are in progress to put out many more. The only chance for the Rail Trade at present appears to be the introduction of new rails made of homogeneous iron, and experiments have been in progress some time with a view to effect this. Sanguine hopes are entertained that, under the direction of I. L. Bell, success will attend those efforts. It is expected that by this process rails will be made equal in quality to Bessemer steel rails, at a much less cost. A further reduction of the wages of ironworkers, blast-furnace men, &c., will shortly become necessary. A number of ironworks and collieries are in the market for sale, but they are, of course, difficult to dispose of. The change in the value of these concerns during the past three years is marvellous.

A meeting of the Northern Institute of Mining and Mechanical Engineers will be held in London on May 30, and following days. The members will assemble in the Theatre of the Institution of Civil Engineers, and the chair will be taken by the President, Mr. Lindsay Wood, at 10 o'clock, A.M., when the following papers will be read:—1. Address by the President, Mr. Lindsay Wood. 2. On the Application of Expansion and Counterbalancing Apparatus applied to Winding Engines, by Mr. John Dalglish. 3. A Description of Ten Different Modes of Lubricating Coal Tubes or Corves, by Mr. Emerson Bainbridge. Afterwards various papers on the subject of pumping stations and various other papers are open for the members to visit. On Wednesday there is no formal meeting, it being Derby day. On Thursday the President will take the chair at 10 o'clock, when the following papers will be read:—1. On the Larger Divisions of the Carboniferous System in Northumberland, by Mr. G. A. Lebour, F.G.S., London and Belgium, F.R.G.S., &c.—2. On Cook's Ventilating Machine, by Mr. William Cockburn. 3. On the Mechanical Effect of Blown-out Shots on Ventilation, by Mr. Henry Hall, Her Majesty's Inspector of Mines, and Mr. George Clark.

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

During the past week there has again been very little doing. In shares of iron and coal concerns, beyond an improvement of 1-16th on Benhar (all paid), the changes to note are all to lower prices; Ebbw Vale having declined ½; Glasgow Port Washington (both classes), 8s.; Omoo and Cleland, 6s.; Arncliffe, ½; Scottish Australian, ½; and Monkland (ordinary), 2s. John Bagnall and Sons offer at 5½; Boleckow, Vaughan, A. 51; Chapel House, about 3; Chillingworth, 3½; buyers, Marcell, 2½; Shotts (new), 9½ to 10; South Wales, 10; and 5pon Lane, ½ dng. It is said a case is now being prepared against the directors of the United Bituminous Company. In shares of foreign copper concerns, Cape, 1 up; also Tharsis, 1 16th, and ditto (7½ paid), ½. Huntington likewise, 1s. better, some decision, presumably favourable to the company, having been given in the case against Mr. Henderson. Canadian Copper Pyrites (all paid), shares, are, however, 3s. 9d. down; and York Peninsula 15 per cent. Guaranteed Preference, ½; the ordinary shares of this company are, however, firmer at 4s. to 7s. In regard to the shares of the York Peninsula Company, the prices they are now selling at are very favourable to investors; it is scarcely credible that the shares of a property, next door to the richest copper mine in the world (the Burra Burra), and now known on which part of its properties the Burra Burra lode ought to be, as can be ascertained at a small outlay at any time the directors decide to do so, laying also between such celebrated mines as Moota and Wallaroo, thus having all the elements to secure success, could be had at present or double present prices. Irrespective also of the mineral value of the property, the freehold land at Bon Accord is a valuable asset, on which the town of Aberdeen is now rising, connected by rail with Adelaide.

In shares of home mines there has been more business doing. Glasgow Caradon has declined 2s. 3d., at 27s. 9d. The 240 tons of ore sold by this company on the 15th inst. realised 1107 10s., or an average of 99s. 9½d. per ton. This compares with 240 tons, at 105s. 9d. sold last month; 240 tons at 118s. 5d., sold in the corresponding month of 1875, and 250 tons, at 93s. in the corresponding month of 1874. Bannockburn, 18s. 6d., sellers. Carn Brea, 29½, buyers. Cargill, 4½, buyers. Cook's Kitchen, 3s. 5½; Dolcoath, 3s. East Tynanville, 4½, buyers. East Van, 1½ to 12; Glen Rhy, 6½ to 7; Gunnside (Glitters), 2 to 3; Hinston Down, ½, sellers. Killbreith, 17s. to 19s.; Marke Valley, 1½ to 1½; Old Treburget, 5s. to 5½; Parys Mountain, 18s. to 19s.; Pateley Bridge, 4 to 4½; Penrhy, 2½ to 2½; Penrhy, 10s. 6d. to 10s. 6d.; Prince of Wales, 1s. to 2s.; Roman Gravel, 15 to 15½; South Condurrow, 4 to 4½; Tankerville, 10 to 10½; West Chiverton, 16½ to 17; West Tankerville, about 2; ditto, preference, 1½ to 2; West Tolgus, 6½; Wheel Agir, Wheel Kitty (St. Agnes), each 2½ to 3; and Wheel Crebor, 2 to 2½. In shares of gold and silver mines Richmonds are again up 5-16th, the run being 850/60. Flagstaff have improved 17½th, but Last Chance is ½ down. Birdseye Creek offer at 38s. 9d.; C. C. Creek, 4½; Chontales, 7s. to 8s.; Colorado Terrible Lode, 1½ to 1½; Don Pedro, ½; Javali, 6s. to 6s.; Pestarena United, 6s. to 7s.; Port Phillip, 7s. to 10s.; Rica, 2s.; Santa Barbara, 29s. 6d. to 30s. 6d.; and Tecoma nominal, at 13s. 6d. sellers. In shares of oil companies, Uphall in request at an advance of ½. Young's Paraffin unaltered at 8½, after being 9½. Young's Paraffin recommends a dividend at 9 per cent., with a balance of 3000, comparing with 5 per cent. at this time last year, showing the improving condition of the Scotch mineral oil trade. In miscellaneous companies shares the only movement is an improvement of ¼ on Scottish Wagon (New). Birmingham Wagon (New) have been done at 5 prem., while 5 per cent. preference shares are asked for at 12½. Swansea Wagon, 5½, sellers. Ayrside Engine offer at 4½. Hopkins, Gilkes, and Co., 2½. Milner's Safe, 11½, and Price's Candle, 12½. Friday last was observed as a holiday on all the Stock Exchanges. Details of the several days' business follow:—

On THURSDAY last very little doing. Canadian Copper Pyrites (all paid) done at 2s. 6d. Cook's Kitchen, 3½, buyers. Huntington done at 4s., closing 4s. 10s. Marke Valley, 1½ to 1½; Montserrat, 3½ to 3½; Penrhy, 10s. 6d. to 10s. 6d.; done at 7 11-16th, closing 7½ to 7 11-16th. South Condurrow, 3½ to 4½. Tharsis done at 19 11-16th, closing 19½ to 19½. West Tankerville done at 2, closing 2 to 2½. Wheel Agir, 2½ to 2½; Wheel Kitty (St. Agnes), 2½, buyers. Young's Paraffin done from 9 to 9½, closing 9 3-16th to 9½.

On SATURDAY market neglected. Benhar done at 10 1-16th. Birdseye Creek about 1 11-16th. Boleckow, Vaughan, A. 50½ to 50½; Cedar Creek, ½ to 10½; Colorado Terrible Lode, 1½ to 1½; Ebbw Vale, 10½ to 11; Lochore and Caplethrae, 7 to 7½; Penrhy, 10s. 6d. to 10s. 6d.; Penrhy, 10s. 6d. to 10s. 6d.; Port Phillip, 7s. to 10s.; Rica, 2s.; Santa Barbara, 29s. 6d. to 30s. 6d.; and Tecoma nominal, at 13s. 6d. sellers. In shares of oil companies, Uphall in request at an advance of ½. Young's Paraffin unaltered at 8½, after being 9½. Young's Paraffin recommends a dividend at 9 per cent., with a balance of 3000, comparing with 5 per cent. at this time last year, showing the improving condition of the Scotch mineral oil trade. In miscellaneous companies shares the only movement is an improvement of ¼ on Scottish Wagon (New). Birmingham Wagon (New) have been done at 5 prem., while 5 per cent. preference shares are asked for at 12½. Swansea Wagon, 5½, sellers. Ayrside Engine offer at 4½. Hopkins, Gilkes, and Co., 2½. Milner's Safe, 11½, and Price's Candle, 12½. Friday last was observed as a holiday on all the Stock Exchanges. Details of the several days' business follow:—

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buyers. Lochore and Caplethrae, 7 to 7½. Monkland, 3s. to 3s. Pestarena United, 6s. to 7s. Richmond done at 8, closing 7½ to 8½. Tharsis done at 19 11-16th, closing 19½ to 19½; new shares, 18 5-16th to 19½. Uphall Oil, 5½, buyers. West Tankerville about 2. York Peninsula (ordinary) done at 4s. 3d., closing 4s. to 7s. Young's Paraffin done at 8½, closing 8½ to 9. Scottish Wagon, 10½ to 10½; new shares, 4½, buyers.

Subjoined are this week's quotations, &c., of mining and metal shares quoted on the Scotch Stock Exchanges:—

Per share.	Paid up.	Dividends.	Description of shares.	Last price.
£ 10	10	10	COAL, IRON, STEEL.	
10	10	10	Arncliffe Coal (Limited)	6½
10	10	10	Benhar Coal (Limited)	10 1-16
10	10	10	Ditto	
100	40	12½	7½t. Boleckow, Vaughan, and Co. (Lim.)	51
10	10	10	Cairnstable Gas Coal (Limited)	9
10	10	10	Chillingworth Iron (Limited)	3½
32	29	7	½t. Ebbw Vale Steel, Iron, and Coal (Lim.)	10½
10	5	nil	Fife Coal (Limited)	3½
10	10	10	Glasgow Port Washington Iron & Coal (L)	2
10	10	10	Ditto Prepaid	2
10	10	10	Lochore and Caplethrae (Limited)	7
10	10	10	Marbella Iron Ore (Limited)	2½
10	10	10	Monkland Iron and Coal (Limited)	13½
10	10	10	Ditto Guaranteed Preference	4½
100	100	nil	Nant-y-Glo & Blaenau Ironworks pref. (L)	30
6	5	15	Omoo and Cleland Iron and Coal (Lim.)	44s.
1	1	19½	Scottish Australian Mining (Limited)	1½
1	1	12½	Ditto New	8s. 6d.
50	50	10	Shotts Iron	7s.
10	10	10	Ditto	10
4	4	—	Canadian Copper Pyrites (Limited)	11s. 3d.
4	3	—	Ditto (£3 paid)	½
10	7	20s	Cape Copper (Limited)	40
2	2	—	Dunsley Wheel Phoenix Tin (Limited)	½
1	1	12½	Glasgow Caradon Copper Mining (Lim.)	27s. 9d.
1	15s.	12½	Ditto New	20s.
10	9	—	Huntington Copper and Sulphur (Lim.)	8s.
25s.	33s.	—	Kapunda Mining (Limited)	2d.
4	4	—	Pandello Copper (Limited)	24s.
10	10	61	Rio Tinto (Limited)	5½
20	20	—	Ditto, 7 per cent. Mortgage Bonds	14
100	100	—	Do, 5 p. c. Mor. Deb. (Sp. Con. Bds.)	53
10	10	nil	Russian Copper (Limited)	2½
10	10	25	Tharsis Copper and Sulphur (Limited)	19 11-16
10	7	25	Ditto New	13½
1	1	—	York Peninsula Mining (Limited)	6s. 3d.
1	1	—	Ditto, 15 per cent. Guaranteed Pref.	7½
1	1	—	GOLD, SILVER.	
1	1	5	Australian Mines Investment (Limited)	8s. 9d.
20	20	—	Emma Silver Mining (Limited)	24s.
10	10	—	Flagstaff Silver Mining (Limited)	2 7-16
5	5	—	Last Chance Silver Mining (Limited)	½
5	5	—	Richmond Mining (Limited)	8
10	7	2½	OIL.	
10	10	—	Dalmenv Oil (Limited)	10s.
10	10	—	Uphall Mineral Oil (Limited)	8½
10	8½	5	Young's Paraffin Light & Mineral Oil (L)	8½
50	25	15	MISCELLANEOUS.	
20	14½	—	London and Glasgow Engineering & Iron Shipbuilding (Limited)	20
10	10	—	Peruvian Nitrate (Limited)	13
10	10	—	Scottish Wagon (Limited)	10½
10	4	—	Ditto New	4½

Last day for this account May 27; settling day, May 31.

NOTE.—The above lists of mines and auxiliary associations is as full as can be ascertained. Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAN, Stock and Share Broker.
Post Office Buildings, Stirling, May 25.

REPORT FROM LANCASHIRE AND CHESHIRE.

May 25.—No change has to be reported in either the coal or iron trades, very serious depression continuing throughout the district. Hitherto there has been a moderate demand for coal for house-fire purposes, but the fine weather is having its usual effect on this branch of trade. Gas contracts are falling in rather numerous just now, and consumers are getting the full advantage of the depression. It had been anticipated that the spring and summer shipments would have improved some departments of the iron trade, but so far these have been much below the average.

A coroner's jury sitting near Wigan has returned an extraordinary verdict upon an accident which took place on the 2nd inst. at the Bryn Hall Collieries. The enquiry had been adjourned until this week to obtain the attendance of the Government Inspector (Mr. Hall), and after hearing his and other evidence the jury found—

"That the deceased, William Radford, died from burns and injuries received on May 2 by an explosion from a blown-out shot then occurring in a certain mine, it not being proved that there was any inflammable gas from the mine adjoining; and that there was no (Mr. Hall) there was any flame attached to the shot or shot lighter with regard to this shot; and they recommend that greater precautions should be used in working the mine in question."

What are the precautions required is not stated, and it is difficult to gather them from any of the published accounts of the evidence. The only points on which the jury can have based their recommendation are in a statement from two of the witnesses, that there was a scarcity of hammers, or in a suggestion from the Inspector that shots should only be fired in the night time, and neither of these seemed to bear on the accident, which was the result of a blown-out shot. Mr. Cippin, the proprietor, stated, in answer to the Government Inspector, that the firing of shots at night made a difference of 15 per cent. in the slack, and would put the colliery owner in a commercial point of view out of the market. He attributed the accident to gross carelessness on the part of the men in ramming the shot.

A meeting of colliery proprietors was held in Manchester, on Monday, to consider what steps should be taken as to the appropriation of the portion of the Hartley Relief Fund surplus allotted to North and East Lancashire. Mr. Dickinson, the Government Inspector, hon. secretary of the fund, submitted a long report concerning it, and it was resolved to invest the money, which has during the twelve years it has been lying in the bank accumulated to over 2000l., in Manchester Co-operative Bonds, and apply the interest in such manner as a committee of 30 coalowners should direct for the benefit of the whole district.

Another colliery's check weigher has been removed from his post by order of the magistrates for interfering with the management of the mine at which he was employed—the Butterworth Hall Colliery, near Rochdale. The defendant's misconduct lay mainly in his having altered the "tares" agreed upon between the employers and the Trades Union. He tried to justify his action by alleging that the boxes in which the coal was brought to the pit's bank were against the men; but it should be known to check weighers that the Mines Regulation Act only authorizes them to "take account" of the weighing, and not to "interfere" therewith.

EXPORTS OF COAL.—By the Monthly Circular of Messrs. Higginson, of Liverpool, we learn the quantity of coal exported in April was 1,258,853 tons, against 1,015,638 tons in the corresponding month of 1875, showing an increase of 183,815 tons. The particulars are—From the Northern Ports, 536,930 tons; Yorkshire, 68,606 tons; London, 4508 tons; Liverpool, 63,515 tons; Severn Ports, 405,653 tons; and Scotch Ports, 159,651 tons. The increase was—Liverpool, 2862 tons; Severn Ports, 205,779 tons; Scotch Ports, 9225 tons. The decrease—Northern Ports, 32,166 tons; Yorkshire, 1358 tons; London, 427 tons. Total, Jan. to April, 1876, 4,067,792 tons; Jan. to April, 1875, 3,336,853 tons; increase, 750,939 tons.

TECHNICAL EDUCATION IN NOVA SCOTIA.—The appreciation of the facilities offered at King's College, Windsor, for the acquisition of sound technical knowledge without leaving the province appears to be constantly extending. The standard has been fully maintained in the papers set at the usual terminal examinations, and taking the result of those studying during Lent term, it appears that only one less passed in chemistry than in divinity; the mathematical passes were more numerous than either; in geology and in surveying about half as many passed as in divinity. The numbers in English literature and in French were very high, and nine passed in German, so that the facts thoroughly refute the assertion which has sometimes been made that the University of King's College is purely a divinity school. Special mention should be made of Fortes and Ambrose, the former standing third in Latin, bracketed second in Greek, second in mathematics, first in French, fourth in chemistry, and tenth in English literature; and the latter standing first in mathematics; bracketed second in Old Testament history, first of his year in French, first in surveying, third in chemistry, second in German, and sixth in English literature. One or two of the student devoting their chief attention to divinity have also taken fair places in the science classes. Altogether the college appears to be progressing satisfactorily.

In the High Court of Justice—Chancery Division. IN THE MATTER OF THE COMPANIES ACTS, 1862 AND 1865, AND IN THE MATTER OF THE COAL CONSUMERS' ASSOCIATION (LIMITED).

THE CREDITORS of the ABOVE-NAMED COMPANY are required, on or before the 1st day of July, 1876, to SEND THEIR NAMES AND ADDRESSES, and the PARTICULARS OF THEIR DEBTS OR CLAIMS, to the Official Liquidator, at the Office of the Official Liquidator, in the City of London, the Official Liquidator, or to the Solicitors, or to the Chamber of the Vice-Chancellor of the County of Middlesex, at No. 3, Stone Buildings, Lincoln's Inn, in the County of Middlesex, such time as shall be specified in such notice, or, in default thereof, they will be EXCLUDED FROM THE BENEFIT OF ANY DISTRIBUTION made by the Liquidator, and such debts as shall be proved, Thursday, the 13th day of July, 1876, at Twelve o'clock, noon, at the said Chambers, is the time appointed for adjudicating on the debts and claims.

HARRISON, BEAL, AND HARRISON, Chief Clerk.
(Solicitors for the Official Liquidator.)
Dated this 18th day of May, 1876.

MANAGER.—AN ENGINEER of extensive practical and commercial experience in the DESIGNING, ERECTING, and MANAGING of COPPER WORKS, treating copper ores both by smelting and the process, as worked by the Tharsis Sulphur and Copper Company (Limited), OPEN to an ENGAGEMENT as a Manager, to past and present employers. First-class references as to ability, integrity, &c., to past and present employers. Address "Manager," care of Messrs. Snell and Co., 88, Temple-street, Bristol.

WANTED, at STONECROFT AND GREYSIDE LEAD MINES, near HEXHAM, TWO GOOD MINE CARPENTERS. References will be required. Apply to the Manager, Mr. WARE, stating wages expected. Dated May 18, 1876.

WANTED, ONE or TWO GENTLEMEN to SPEND £2000 for the purpose of CARRYING OUT TRIALS in a promising SILVER LEAD and COPPER ORE MINING GRANT in NORTH CORNWALL. The sett is about a mile square, and contains seven known lodes. For particulars and terms apply to "P. H.," Padstow, Cornwall.

WANTED, a thoroughly practical and energetic Man, as GENERAL MANAGER OF MINES AND IRONWORKS in SPAIN. Should understand Mining, and must be well up in Smelting Ores by the Furnace Process, and know the details of Forge and Mill Work. To a good knowledge of the Spanish language, and the climate is very mild, and there is a manager's house furnished. Application, by letter, to Mr. WILLIAM GIBBS, Metal Broker, Wolverhampton, or to Mr. SAMUEL DANKS, Engineer, Hadley Park, Salop.

MINE AGENT. A Practical Miner, a SITUATION, at home or abroad. Has been some years in Spain, and can speak and write Spanish fluently. Thoroughly competent to assay and survey, and to manage any mining property. "G. R. J.," care of housekeeper, 28, Cornhill, London.

WANTED, a SITUATION as a WORKING MINING SMITH or ENGINEER, by a steady and respectable man. Has been about 15 years in the same capacity. Open to an immediate engagement. Good references. Address, care of C. E. PEARSE and SOX, Auctioneers, &c., Fore street, Bolton.

WANTED, at the PRINCE PATRICK MINE, HALKIN, FIFTY ABLE-BODIED MINERS. Apply to Capt. Wm. ROBERTS, Prince Patrick Lead Mine, Halkin, Holywell.

WATER-WHEEL. WANTED, an OVERSHOT WATER-WHEEL, NEW or SECOND-HAND, either 40 ft. or 50 ft. diameter, by 4 ft. or 5 ft. breast, with all necessary attachments. Also, about 275 fms. of 3 in. diameter best quality IRON PUMPING RODS, JOINT PLATES, and PINS, complete. Address, with prices and full particulars, to "Secretary," Belstone Mining Company (Limited), 2, Royal Exchange Buildings, London, E.C.

EDUCATION—ENGINEERING. A CIVIL ENGINEER of experience at home and abroad, also a very successful Tutor, RECEIVES A FEW PUPILS at his residence, to whom he imparts a SOUND and USEFUL KNOWLEDGE of MATHEMATICS, MECHANICAL PHILOSOPHY and DRAWING, NATURAL SCIENCE, including Chemistry and Geology, LAND SURVEYING and LEVELLING in all its Branches (Theoretically and Practically, with the Use of Instruments). Great attention also paid to Modern Languages. For terms and further particulars, apply to "C. E.," Stoneley, Howard-road, South Norwood, London, S.E.

FERRO-MANGANESE. A GENTLEMAN, having a market for this article, will be glad to communicate with a view to its MANUFACTURE. Address, "Ferro Manganese," MINING JOURNAL Office, 26, Fleet-street, London.

TO MINING COMPANIES. A MINE AGENT, of long experience in Cornwall and Foreign Countries—thoroughly acquainted with Mine Machinery, and the most modern Dressing Apparatus for Lead, Blende, and Copper; speaks English, French, and German; furnishes valuable information on French English Mines; inspection undertaken—DESIRE a RE-ENGAGEMENT. Address, "C. E.," Vaumoron, Caylux, Tarn-et-Garonne, France.

A BARGAIN. TWO HOWARD'S TRACTION or WINDING ENGINES FOR SALE, 14-horse power, near BANBURY. Apply to Mr. LAMPITT, Banbury.

FOREST OF DEAN. VALUABLE IRON MINES FOR SALE.—Some opened and in good working order, others partially developed. TWO LARGE COLLIERIES FOR SALE. Reliable information upon Forest of Dean Investments. WM. HENDERSON, Mining Engineer, Newham.

FOR SALE.—THE LEASE of a VALUABLE LEAD MINE in CORNWALL, close to sea, adjoining mine producing 75 per cent. of lead. Address, "D. A.," Deacon's, 154, Leadenhall-street.

MESSRS. A. ENDEAN, FISHER, AND CO., STOCK AND SHARE DEALERS, 3, LOMBARD COURT, LOMBARD STREET, E.C.

Bankers: London and Westminster, Lombury.

MR. R. PERCY ROBERTS, FINANCIAL AGENT, 40, ENGLISH STREET, CARLISLE.

CAPTAIN ABSALOM FRANCIS, MINING AGENT, ENGINEER, AND SURVEYOR, GOGINAN, ABERYSTWTH.

MR. J. S. MERRI, ASSAYER AND ANALYTICAL CHEMIST, SWANSEA.

MR. W. F. STANLEY, MATHEMATICAL INSTRUMENT MANUFACTURER TO H.M. GOVERNMENT, COUNCIL OF INDIA, SCIENCE AND ART DEPARTMENT, ADMIRALTY, &c. MATHEMATICAL, DRAWING, AND SURVEYING INSTRUMENTS of every description, of the highest quality and finish, at the most moderate prices. Price-list post free. ENGINE DIVISION TO THE TRADE. ADDRESS—GREAT TURNSTILE, HOLBORN, LONDON, W.C.

RIO TINTO COMPANY (LIMITED). FIVE PER CENT. MORTGAGE (SPANISH COUPON) BONDS. DELIVERY OF DEFINITIVE BONDS.

NOTICE IS HEREBY GIVEN, that on and after the 1st of June, 1876, the following may be deposited for EXCHANGE against DEFINITIVE BONDS as follows, viz.:—IN LONDON: At the offices of the company, No. 2, Copthall Buildings, E.C., between the hours of Ten and Two. Saturdays, Ten and One. IN PARIS: At the offices of the Société Générale des Crédits Industriels et Commerciaux, 72, Rue de la Victoire. IN BRUSSELS: At the Banque de Bruxelles, 22, Rue Royale. Lists for deposit of scrip can be obtained at any one of the three addresses above, and the scrip must be left seven days for examination. The Bonds have coupons attached, and are in three series, viz.:—A Nos. 1 to 54,225 ... 54,225 Bonds of £20 each. B Nos. 54,226 to 63,250 ... 8,725 Bonds of £100 each. C Nos. 63,251 to 63,686 ... 435 Bonds of £200 each. Should holders desire Bonds of different denominations from their Scrip, they are requested to state their requirements on the list, and the company will endeavour to meet their wishes. By order of the Board, R. J. FENNESSY, Secretary. Offices of the Company: 2, Copthall Buildings, London, E.C., May, 1876.

COAL MINES REGULATION ACT, 1872.

EXAMINATION FOR MANAGERS' CERTIFICATES OF COMPETENCY.
DISTRICT UNDER THE CHARGE OF FRANK N. WARDELL, Esq.,
H.M. INSPECTOR OF MINES.

NOTICE IS HEREBY GIVEN, that an EXAMINATION for MANAGERS' CERTIFICATES OF COMPETENCY, under the above-mentioned Act, will be held on the 27th day of June next, and CANDIDATES intending to PRESENT THEMSELVES at such EXAMINATION must, on or before the 5th day of June next, notify such intention to the Secretary of the above-mentioned District, from whom all information as to particulars can be obtained.

By order of the Board,
JOHN R. JEFFERY, Secretary.
6, Piccadilly, Bradford.

N.B.—Persons who do not reside within the district are equally eligible for examination with those who do.

SHREWSBURY GAS-LIGHT COMPANY.
TENDERS FOR GAS COALS.

THE DIRECTORS are prepared to RECEIVE TENDERS for the SUPPLY of SIX THOUSAND FIVE HUNDRED to SEVEN THOUSAND TONS of the best description of SCREENED GAS COALS, for one or more years, as may be determined upon by the directors. The coals to be as free as possible from sulphur, bats, bind, refuse, and dirt, and delivered free, by and at the expense of the contractor, at the London and North-Western or Great Western Railway Station, Shrewsbury.

Tenders, specifying the coals and the pits at which they are to be raised, must be delivered on or before the 1st day of June next.

The lowest or portion of any tender will not of necessity be accepted. Payments to be made by the directors.

S. P. DARWIN, Secretary.

SILVER-LEAD MINE.
TO FINANCIERS AND SPECULATORS.

FROM £3000 to £4000 are REQUIRED to DEVELOPE a MINING PROPERTY, which at the depth attained has proved unusually rich for Silver Lead.

To inspect, and for full particulars, address "X," MINING JOURNAL Office, 26, Fleet Street, London.

MANGANESE AND SULPHUR ORES.

MESSRS. BROWN, BUTLER, AND CO.,
MINERAL MERCHANTS, AGENTS, AND BROKERS,
are OPEN TO TREAT for the PURCHASE of LARGE QUANTITIES of the ABOVE or other MINERALS, to be delivered in Liverpool. Particulars, naming quality and price, will receive immediate attention.

Address, Brockley Buildings, 51, South John Street, Liverpool.

TO MINING COMPANIES, AND OTHERS.

THE ENGLISH THARSIS is a Maiden Mine, situated in SOUTH WALES, at a point where the geological formations give promise of great mineral wealth, within half a mile of a railway station, and about eight hours' journey from London.

A specimen of the ore found has been pronounced on analysis by a well-known mineralogist to contain 53 parts of sulphur and 46 parts of iron.

For further particulars as to terms of working, &c., apply to Messrs. LEATHES and MAXWELL, 3, Langham-place, Portland-place, London, solicitors.

A CAPITAL OPPORTUNITY FOR INVESTORS.

A MERCHANT in the City, a Shareholder in the TALLYBONT SILVER-LEAD MINING COMPANY (LIMITED)—a most promising mining company, the shares of which, like the East Vans, may any day go at a tremendous premium (see report in *Mining Journal*), being in want of £3000 to £4000, is compelled to SELL some of his shares at a small reduction (they are 50s. shares).

Application to "Tolliday," care of Messrs. Deacon, 154, Leadenhall-street, E.C.

VALUABLE LEAD MINE, IN NORTHUMBERLAND, FOR SALE.

Present stope opened to depth of 20 fathoms from surface, valued at 10 tons lead ore per fathom. Terms very favourable.

Apply to THOMAS BELT and Co., Mining Engineers, 33, Southampton Buildings, Chancery-lane, London.

MAX SILVER-LEAD MINERAL COMPANY (LIMITED).

In consequence of the recent valuable discoveries, and the large number of applications for shares, the SHARE LIST in this promising Mine will be CLOSED JUNE 30th, 1876.

W. A. HOLLOWAY, Managing Director, Douglas, Isle of Man.
GEO. W. HUGHES, Secretary, 4, Cable-street, Liverpool.

N.B.—No smaller number than twenty-five can be allotted.

CESENA SULPHUR COMPANY (LIMITED).

Notice is hereby given, that the ANNUAL GENERAL MEETING of the Shareholders will be HELD at the office of the company, 4, Finsbury Circus, London, E.C., on THURSDAY, the 5th day of June, at 2.30 o'clock in the afternoon, to consider the report and balance-sheet, to elect directors and auditors, and for the transaction of the general business of the company. Holders of share warrants to bearer desirous of attending the meeting must deposit the warrants at the company's office in London three clear days prior to the meeting, in accordance with the Articles of Association.

By order of the Board,
R. LARCHIN, Secretary.
Office, 4, Finsbury Circus, London, E.C., 20th May, 1876.

GLASGOW AND THE HIGHLANDS.

ROYAL ROUTE, VIA CRINAN AND CALEDONIAN CANALS,
by Royal Mail Steamer, IONA, from GLASGOW, daily at Seven A.M., and from GREENOCK at Nine A.M., conveying passengers for the NORTH and WEST HIGHLANDS.

See Bill, with Map and Tourist Fares, free, at Messrs. CHATTO and WINDUS, Publishers, 74, Piccadilly, London; or by post from DAVID HUTCHESON and Co., 10, Hope-street, Glasgow.

LOCOMOTIVE TANK ENGINES.

FOR MAIN LINE TRAFFIC, SHORT LINES COLLIERIES,
CONTRACTORS, IRONWORKS, MANUFACTURERS, &c., from a superior specification, equal to their first-class Railway Engines, and specially adapted for steep gradients, may always be had at a short notice from—

MESSRS. BLACK, HAWTHORN, AND CO.,
LOCOMOTIVE, MARINE, AND STATIONARY ENGINE WORKS.

FOR SALE:—

A 40 in. CORNHILL BEAM PUMPING ENGINE, 9 ft. stroke in cylinder, and 7 ft. in shaft (by Peran Foundry Company), in good condition.

THREE 30 ft. by 6 ft. 6 in. SINGLE FLUED BOILERS, with all fittings complete, of the above nearly new.

ONE 12 in. cylinder HORIZONTAL STEAM CAPSTAN, with drawing gear and drum complete, is equal to new.

Price for the lot as they stand, £150.

Apply—
JAMES PAYNE, WREXHAM.

FOR SALE, A 35-horse power PORTABLE STEAM ENGINE,

with link motion reversing gear, ready for delivery.

An 18 horse power VERTICAL STEAM ENGINE, with link motion reversing gear, also gear to wind and pump.

A 24 in. PAN MORTAR MILL, VERTICAL ENGINE, and BOILER.

Apply to—
BARROWS AND STEWART, ENGINEERS, BANBURY.

FOR SALE.

THE UNDERMENTIONED STOCK OF SUPERIOR SECOND-HAND STEAM ENGINES, &c.:—

ONE 40 in. cylinder CORNHILL PUMPING ENGINE, 10 ft. stroke in cylinder, with or without TWO BOILERS of 10 tons each.

ONE 40 in. cylinder CORNHILL PUMPING ENGINE, 10 ft. stroke.

ONE 34 in. cylinder CORNHILL PUMPING ENGINE, 8 ft. stroke.

ONE 24 in. cylinder ROTARY ENGINE, 8 ft. stroke, with TWO FLY WHEELS.

ONE 24 in. cylinder ROTARY ENGINE, 8 ft. stroke, with FLY WHEEL of 10 tons, and winding drum.

ONE 24 in. cylinder ROTARY ENGINE, 6 ft. stroke, with PUMPING GEAR for pumping and winding, and BOILER 3 tons.

ONE 10 in. HORIZONTAL CONDENSING ENGINE, geared for pumping and winding, and BOILER 5 tons.

ONE 12-horse power PORTABLE ENGINE, with pumping gear, FOR SALE.

Also a LARGE STOCK OF PUMP-WORK, from 6 to 20 inches in diameter, ENGINES, BOILERS, STRAPPING PLATES, BALANCE BOBS, CHAINS, WHEELS, &c., &c.

The above will be found in good condition, and well worthy the attention of purchasers.

Apply to—
F. W. MICHELL AND CO.,
EAST CARN BREA, REDRUTH, CORNWALL.

In the "Colliery Managers' Pocket Book," page 145, it is clearly shown that the cost of working the Cornish Engine is considerably less than one-half of the cost of working any other engine.

MINING PROSPECTUSES AND ANNOUNCEMENTS OF PUBLIC COMPANIES should be inserted in the BARNSTABLE TIMES every Tuesday, and in the DEVON POST, published every Saturday, as notices of investors circulate largely throughout Devon and Cornwall, where many thousands of investors reside. Legal and Public Companies' advertisements, &c., a line published by J. B. Jones, Bouthport-street, Barnstaple, Devon, to whom all orders for notices should be sent.

TO IRONMONGERS, SHIP CHANDLERS, SMITHS, ENGINEERS, &c.

MR. MITCHESON has received instructions TO SELL, BY PRIVATE TENDER, to be sent in by the 16th day of June, 1876, the undermentioned GOODS lying at THAMES STREET WHARF, ROTHERHITHE, close to Commercial Dock Pier:—

Forges, &c., with bellows, complete; patent scale, with weights; bench; vices; iron water-tight tanks; water-buff; case of smith's tools; sundry advertisements; tools; trucks; trolleys; patent forges; frames; casks of iron ore; stillyards; weights; iron bench; two martingales; shackles; deal boards; poles; anchor stocks; quantity of timber; bellows; desks; two chain rollers; ironwork; waterbutt; ballast buckets; iron wheels; a set of steps, &c.

Forms of Tender and order to view may be obtained on application at Mr. MITCHESON'S Auction and Estate Agency Offices, 32, Crutchedfriars, Mark-lane, London, E.C.

IN LIQUIDATION.
CLYNE AND LOWER RESOLVEN COLLIERIES, NEATH, GLAMORGANSHIRE.

MESSRS. FULLER, HORSEY, SON, AND CO. are instructed by the Liquidator of the Welsh Steam Coal Collieries Company (Limited), to SELL, BY AUCTION, on the Premises, Clyne and Lower Resolven Collieries, near Neath, on Tuesday, June 27th and following day, at Twelve o'clock precisely, the nearly new

FIXED PLANT AND MACHINERY,

LOOSE TOOLS, UTENSILS, AND STORES, including a new 400-horse power high and low pressure STEAM ENGINE (see following advertisement); two pairs high pressure WINDING ENGINES, by Galloway and Fletcher and Sons, with cylinders 18 and 12 diameter; a high pressure horizontal PUMPING ENGINE, with 24 in. cylinder; two horizontal and vertical ENGINES; beam STEAM ENGINE, with 20 in. cylinder; five Galloway's patent BOILERS, nearly new, 6 ft. 6 in. diameter, 28 ft. long; three STEAM BOLLERS; powerful capstan drum, equal to 40 tons; capstan; seven winding drums; rope pulleys and frames; ventilating fan; donkey pump; hydraulic pump, by Hathorn Davis and Co.; Niagara and universal steam pumps, by Hayward Tyler and Co.; five double purchase crabs; a nearly new 14 horse power double cylinder portable ENGINE, by Clayton and Shuttleworth; cast iron mortar mill, with 7 ft. pan; circular saw bench; 20 tons mining gear; 48 tons new cast iron pipes; 128 tons cast iron pipes and fittings; 12 tons cast iron water pipes; 35 new permanent way rails, with points and crossings; 104 tons tram rails; 6240 timber sleepers; a 20 ton railway wagon weightbridge, Hind's patent, by Kitchen; 12 tons New Staffordshire plate and bar iron; 20 tons steel wire rope; 1100 yards of iron ditto; 3 tons chain; rotary coal screens; 20 tons hydraulic jacks; 7 tons wrought and cast scrap; 97 coal trams; smiths' and engineers' tools; 2 sets of Whitworth's screwing tackle; about 100 loads of useful timber, deals and battens; 13,000 fire bricks; 2 useful horses, carts, harness; quantity of stores; 340 tons small coal; office fixtures, and numerous other effects.

There are sidings to both collieries from the Vale of Neath Railway, so that goods can be easily loaded into trucks.

May be viewed Saturday and Monday preceding, and mornings of sale, and catalogues had of HENRY WILSON, Esq., the Liquidator, Bartholomew House, Bartholomew-lane, E.C.; at the Castle Hotel, Neath; at the Collieries; and of Messrs. FULLER, HORSEY, SON, and Co., 11, Billiter square, London, E.C.

IN LIQUIDATION.
CLYNE AND LOWER RESOLVEN COLLIERIES, NEATH.

MESSRS. FULLER, HORSEY, SON, AND CO. will INCLUDE in their SALE on Tuesday, June 27, a new 400-horse power differential, expansive, direct horizontal, compound, high and low pressure PUMPING ENGINE, by Hathorn, Davis, Campbell, and Davey (Davey's patent), with cylinders steam jacketed, 34 in. and 64 in. diameter, 7 ft. 6 in. stroke.

May be viewed, and further detailed particulars contained in catalogues, which may be had as in preceding advertisement.

TYRONE COAL FIELD.

TO BE SOLD, BY PRIVATE TREATY, as a going concern, all the COLLIERIES, with the ENGINES, PLANT, &c., belonging to the TYRONE COAL MINING COMPANY (LIMITED), near DUNGANNON, IRELAND.

The leases cover an area of about 3320 acres, and comprise the principal part of the Tyrone Coal District. The present yield of coal is from 300 to 350 tons weekly, but the deep pit at Curran is sunk to within 60 to 70 yards of the Main or Five-foot seam of coal, and when this is opened out the quantity available will be enormous.

Professor HULL, in his report on these collieries, estimated the available quantity of coal in the company's grants at 3,600,000 tons.

These collieries are situated in the centre of an extensive manufacturing district. The Dungannon and Cookstown Railway, about to be made, will pass through them. The Dungannon Station of the Great Northern Railway of Ireland is within 1½ mile of the works, and the Ulster Canal at Coalisland is about the same distance, thus giving rail and water communication with the entire markets of the North and West of Ireland for the coal.

The capital required for the completion of the deep colliery is very small indeed, and a rare opportunity is offered to coalmasters and capitalists to obtain a colliery circumstanced locally, where prices can be obtained for the coal fully 50 per cent. above those realised on English and Scotch collieries, arising from its inland position and freedom from the usual competition of other large coal fields.

Application to treat, and for viewing the works, may be made to the undersigned.

SILAS EVANS, Liquidator.
Dated 9, Victoria Chambers, Belfast, 29th April, 1876.

TO CAPITALISTS.

TO BE DISPOSED OF, A VALUABLE SLATE QUARRY, known as the

CLONEY BRIEN SLATE QUARRY.

Near KILLALOE, IRELAND, now in full working order, producing a large quantity of slates of the most superior descriptions and of excellent quality, and highly approved of by the public. The proprietor has expended a large sum of money in opening and clearing the quarry, and putting it in good working order, and by a judicious outlay of capital will be one of the best and most profitable quarries in the country. The supply may be said to be inexhaustible, and easy of access.

The sett consists of 419 acres statute; the term 99 years; and the royalty 1-15th, or a dead rent of £40 in the event of the royalty not producing that amount.

The past years the demand for slates has considerably exceeded the supply. Orders are still in unexecuted, and there is every probability of a yearly increasing demand, equal to the prosperity of the country.

It is a well known fact that there are few greater sources of wealth than slate quarries when judiciously and economically managed, and the facility afforded, both by rail and water carriage at Killaloe to all parts of Ireland, and the shipping port of Limerick, ensures a large and constant demand.

Also, TO BE LET, in the immediate neighbourhood, TWO other QUARRIES, known as the

LOUGHTEA AND TOWNLOUGH SLATE QUARRIES.

Which have been extensively worked (and were only abandoned owing to the death of the late proprietor), with the right of quarrying over 154 acres, and a right of way to the shore of Lough Derg, where slates can be shipped to all parts of Ireland.

The terms of these are £70 and £15 respectively, or the alternative of a royalty of 1-15th.

There is an excellent two storied slated house recently erected, suitable for a resident manager, and enclosed yards and offices connected with the quarries.

Leases will be granted to an eligible tenant for 99 years.

These establishments combined could be made a very large concern, surpassing many of the quarries in Wales.

For further particulars, apply to—
WILLIAM HEACHE, Esq., Johnstown Park, Nenagh, Ireland.

TO CAPITALISTS OR PROMOTERS DESIRING TO MAKE MONEY.

TO BE SOLD, A COLLIERY ROYALTY IN NORTH WALES, close to rail or shipping port; several shafts partially sunk; coal fully proved of FOUR SEAMS of good HOUSE and STEAM COALS, in an area of upwards of 400 acres of surface. It adjoins the West Mostyn Coal Field, just successfully launched, where under seams (including Cannel) have been proved in addition to the above; so that eminent engineers state that the available coal in this royalty, may be 85 feet thick.

Present holder will arrange to sell the entire to an individual or company for what it has cost him, dividing all profit made above, which, even in a normal state of the coal trade, must be large. Certain and safe surveys by eminent Staffordshire and Welsh engineers have already been made.

Address, "Nil Desperandum," care of Mr. Watson, 15, Fenwick-street, Liverpool.

FOR SALE, OR TO RENT, THE COAL MINES OR COLLIERIES

situated in TURRUNCAN and PREJANO (Province of LOGRONO, SPAIN), about 25 kilometres by rail between Bilbao and Tudela.

The coal according to the report of the engineer, Mr. Chevalier, is suitable for producing gas; these mines also produce a quality which appears equal to English Cannel Coal.

The works of exploration already completed show that coal in considerable quantities exists in these mines.

For further particulars and details, as well as for terms of sale or rental, address Don PEDRO RIBES, Pamplona, Spain.

LEAD MINE NEAR CARSPHAIN, STEWARTRY OF KIRKCOUBRIGHT.

TO BE LET, with immediate entry, and for such number of years as may be agreed upon, the

WOODHEAD LEAD MINE,

On the Craigieglan Estate, situated in the parish of Carsphairn and Stewartry of Kirkcubright.

This mine was opened in 1838, has been wrought ever since, and has yielded a large quantity of lead of the finest quality. The plant, machinery, &c., can be had at a valuation.

JAMES MC CALL, at the Mine, will show the underground workings, as also the plans and sections; and for further particulars application may be made to ALEXANDER MC CUBBIN, Solicitor, Ayr; or to Mr. THOS. SMITH, Land Steward, Berthel Mains, Dalmellington, Ayrshire.

Ayr, May, 1876.

SULPHATE OF BARYTES FOR SALE.

Fine powdered, beautifully white; also in the Rock or Crude State, free from Lime and Metallic Oxides.

Samples on application to—
RUTHWAITE BARYTES MINING COMPANY,
Nov. 17, 1875.

RAILWAY CARRIAGE COMPANY (LIMITED).—

ESTABLISHED 1847.
OLDBURY WORKS, NEAR BIRMINGHAM.

MANUFACTURERS OF RAILWAY CARRIAGES AND WAGONS, and EVERY DESCRIPTION OF IRONWORK.

Passenger carriages and wagons built, either for cash or for payment, over a period of years.

RAILWAY WAGONS FOR HIRE.
CHIEF OFFICES, OLDBURY WORKS, NEAR BIRMINGHAM.

LONDON OFFICES, 7, GREAT WINCHESTER STREET BUILDINGS.

THE BIRMINGHAM WAGON COMPANY (LIMITED)

MANUFACTURE RAILWAY WAGONS OF EVERY DESCRIPTION, for HIRE and SALE, on immediate or deferred payments. They have also wagons for hire capable of carrying 6, 8, and 10 tons, part of which are constructed especially for shipping purposes. Wagons in working order maintained by contract.

EDMUND FOWLER, Sec.
WAGON WORKS, SMETHWICK, BIRMINGHAM.

* Loans received on Debenture; particulars on application.

Now ready, pocket size, 400 pp., with Two Folding Copper Plates of Scales of Foreign Measures compared with the English Foot, and Fixed Scales of Squares, Cubes, and Rods, Areas, Decimal Equivalents, &c., bound in leather, with elastic band, price 6s., postage 3d.

IRON AND STEEL: A work for the Forge, Foundry, Factory, and Office. Containing ready, useful, and trustworthy information for Ironmasters and their Stockholders; Managers of Bar, Rail, Plate, and Sheet Rolling Mills; Iron and Metal Founders; Iron Ship and Bridge Builders; Mechanical, Mining, and Consulting Engineers; Architects, Contractors, Builders, and Professional Draughtsmen.

By CHARLES HOARE, Author of "The Slide Rule," &c.
Eighth Edition, revised throughout, and considerably enlarged.

London: CROSBY LOCKWOOD and Co., 7, Stationers' Hall-court, E.C.

FOURTH EDITION.
LEAD MINING COMPANIES.

Investors are informed that
This day is published, price 1s. 6d.,
By J. H. MURCHISON, Esq., F.R.G.S.,

A FOURTH EDITION of his Pamphlet on BRITISH LEAD MINES, together with the following MAPS, showing the position of the principal LEAD MINES, &c., &c., specially prepared by Mr. MURCHISON. The whole revised and added to

1.—DURHAM AND NORTHUMBERLAND.
2.—SHROPSHIRE.
3.—CARDIGANSHIRE AND MONTGOMERESHIRE.

Copies can be obtained at Mr. MURCHISON'S Office, 8, Austinfriars, London.

OPINIONS OF THE PRESS
ON FIRST EDITION.

"Mr. J. H. Murchison has published a pamphlet on 'British Lead Mines,' which contains a good deal of information that may prove useful at present.

Mr. Murchison's theory is exactly that on an average British lead mines have less of the lottery element in them than any others, and the figures he gives seem to support that view; at all events, those interested in this industry will find his facts and observations worth reading."—*Times*.

"After some very sensible remarks, and some hints as to the points to consider in forming an opinion as to the merits of a mine, Mr. Murchison goes thoroughly, and in a most able manner, into the object of his pamphlet. . . . We are obliged to defer till next week going into the numerous valuable facts and figures which are so prominent in every page of Mr. Murchison's pamphlet; but we must at once congratulate him on a production which is calculated to do much good to the mining interest, and to be a great benefit to investors."—*Mining Journal*.

"We heartily recommend capitalists to obtain and study the contents of this pamphlet, for we believe that no publication ever issued from the press which was more calculated to do good to an important British interest."—*Mining Journal*.

"Mr. J. H. Murchison, F.R.G.S., has just issued a neat little pamphlet on the British lead mines, illustrated by admirably executed maps of the chief lead mining districts of the kingdom. Mr. Murchison has a very high opinion of the value of that important item in our national industry, lead mining; and in the work before us he fully justifies that opinion. . . . and we have great pleasure in recommending his treatise, which contains much statistical information, to the notice of our readers."—*Morning Post*.

"Mr. Murchison, of Austinfriars, has lately published a pamphlet on British Lead Mines, which shows that this department of British industry is in a satisfactory state."—*Globe*.

"Few persons are more competent to compile such a work than Mr. Murchison, and it will be found a handy book of reference by all investors. . . . We recommend those who are said at present to have an superabundance of money, for which they cannot find good investments, to read and carefully consider Mr. Murchison's pamphlet."—*Mining World*.

"He (Mr. M.) shows that lead mining is quicker, safer, and less expensive than any other, and that the price of lead is generally steadier than that of other metals. . . . A great deal of valuable and useful information will be found in Mr. Murchison's pamphlet, which is embellished with three well-executed maps of the principal lead mining districts."—*Financial*.

"Under the title of 'British Lead Mines,' a pamphlet has been published by Mr. J. H. Murchison, F.R.G.S., of 8, Austinfriars, with the object of showing that the operations in British lead mines have in many instances led to very profitable results."—*Standard*.

"A pamphlet well worthy of consideration. . . . In these times of general depression it is satisfactory to find an important British interest in a prosperous state, and we invite capitalists to look into this means of investment."—*Money Market Review*.

"Mr. Murchison publishes in a concise form particulars of the past history and present position of some of the principal British lead mines. . . . A chapter on public lead mining companies, their aggregate capital, dividends, and market value, will not be the least recommendation to the popularity of this production."—*Monetary Gazette*.

"This is a valuable book of reference, dealing in a summarised form with a large mass of statistical information affecting the mining interests of England. We seldom see so much practically useful information compressed into the same space."—*Irish Times*.

"Parties interested in this description of investment will find a good deal of useful information in this pamphlet."—*Bristol Daily Post*.

"An interesting pamphlet, with carefully drawn maps, of the lead mining districts of England and Wales: . . . but apart from its special value in that direction, the work is useful. . . . The pamphlet must be of the greatest value as affording plain and reliable data to guide them (those interested in this industry) in their speculations."—*Preston Guardian*.

"Valuable and interesting information is given relating to British lead mines."—*Portsmouth Times*.

"The pamphlet, which contains several excellent maps, should be in the hands of every mining investor."—*Cheltenham Express*.

"Mr. Murchison is an authority on the subject of the value and productiveness of our British Lead Mines, he having made that department of metallurgy his special study. His opinions, therefore, deserve the careful consideration of intending investors in this class of mines. Mr. Murchison, we see, brings forward a very considerable array of facts and figures to support his opinion, which is strongly in favour of British lead mines as an investment for British capital. It would certainly be better for English savings to be spent in developing English industry rather than to be sent (as they often are) abroad, to be lost in dangerous foreign speculations."—*Southampton Observer*.

"This work deserves the attentive perusal of those that have money to invest, and who may be thinking of purchasing shares in that particular branch of mining treated of in the work before us. . . . A large amount of information is undoubtedly given in these pages, which has the greatest possible interest for investors generally."—*Hampshire Advertiser*.

The book will be found well worth reading."—*Glasgow Herald*.

MAPS OF THE MINES, AND OF UTAH TERRITORY.

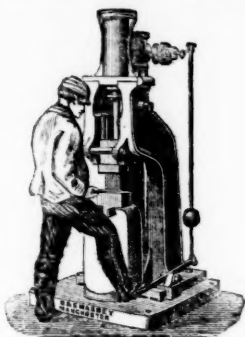
B. & S. MASSEY, OPENSHAW, MANCHESTER.

Prize Medals—Paris, 1867; Havre, 1868; Highland Society, 1870; Liverpool, 1871; Moscow, 1872; Vienna, 1873; Scientific Industry Society, 1875; Leeds, 1875; Paris, 1876.

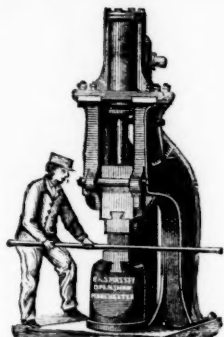
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STEAM HAMMERS

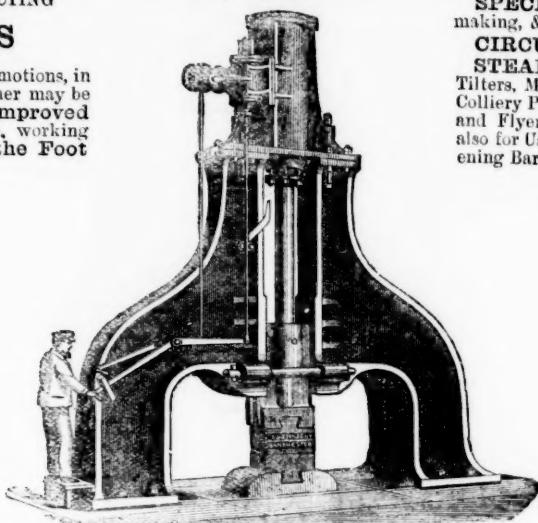
Of all sizes, from $\frac{1}{2}$ cwt. to 20 tons, with self-acting or hand motions, in either case giving a perfectly DEAD BLOW, while the former may be worked by hand when desired. Large Hammers, with Improved Framing, in Cast or Wrought Iron. Small Hammers, working up to 500 blows per minute, in some cases being worked by the Foot of the Smith, and not requiring any separate Driver.



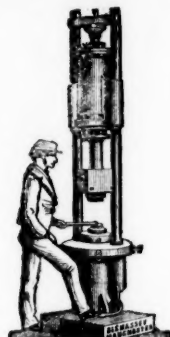
Small Hammer with Foot Motion.



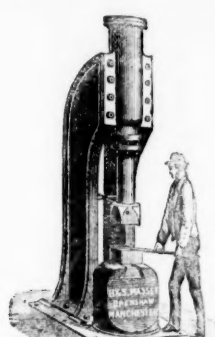
General Smithy Hammer.



Steam Hammer for Heavy Forging.



Special Steam Stamp.



General Smithy Hammer.

From 60 to 100 Steam Hammers and Steam Stamps may usually be seen in construction at the Works.

SPECIAL STEAM STAMPS, for Forging, Stamping, Punching, Bolt making, &c.

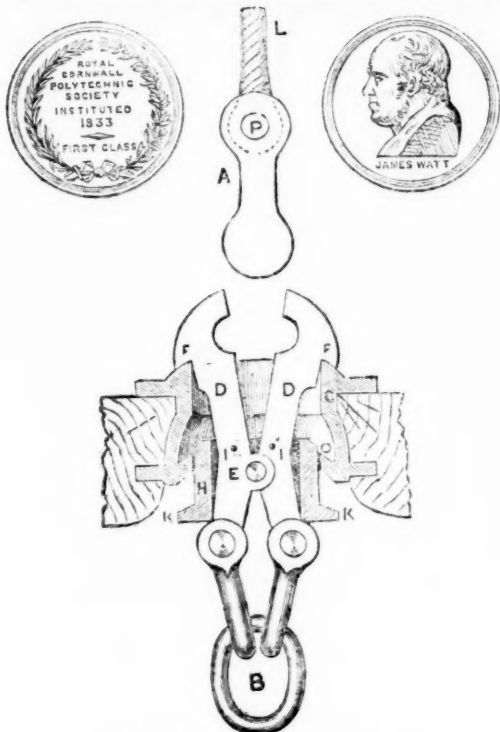
CIRCULAR SAWS for Hot Iron.

STEAM HAMMERS for Engineers, Machinists, Shipbuilders, Steel Tilters, Millwrights, Copper Smiths, Railway Carriage and Wagon Builders, Colliery Proprietors, Ship Smiths, Bolt Makers, Cutlers, File Makers, Spindle and Flyer Makers, Spade Makers, Locomotive and other Wheel Makers, &c.; also for Use in Repairing Smithies of Mills and Works of all kinds; for straightening Bars, bending Cranks, breaking Pig-iron, &c.

OVERWINDING IMPOSSIBLE.

WALKER'S DETACHING HOOK,

FOR COLLIERIES AND BLAST-FURNACE HOISTS.



SIX LIVES SAVED.

Walker's Hook, at Tockett's sinking, has saved six men's lives. On the 6th instant, the kibble was overwound, and but for the hook would have fallen down the pit, where six men were working, 120 ft. below, all of whom would probably have been killed. Thanks, however, to Mr. Walker's invention, the rope alone passed harmlessly over, the kibble remained suspended, and in half-an-hour everything was working as if nothing had occurred.—From the *Northern Echo* August 20, 1874.

Full particulars may be obtained from the Manufacturers,—

THOMAS WALKER AND SON,
58, OXFORD STREET, BIRMINGHAM

THE PHOSPHOR BRONZE COMPANY (LIMITED).



OFFICES:
139, CANNON STREET, E.C.
FOUNDRY:
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INGOTS, Nos. I or II, suitable for Pumps, Pinions, Ornamental Castings, &c. £130 per ton
Nos. VI. or VII., suitable for Valves, Plungers, Bushes and Bearings, Fans, &c. £145 per ton
Special Phosphor Bronze Bearing Metal £120 per ton
CASTINGS, Wire Ropes, Tuyeres, &c., of all descriptions executed at the shortest notice.

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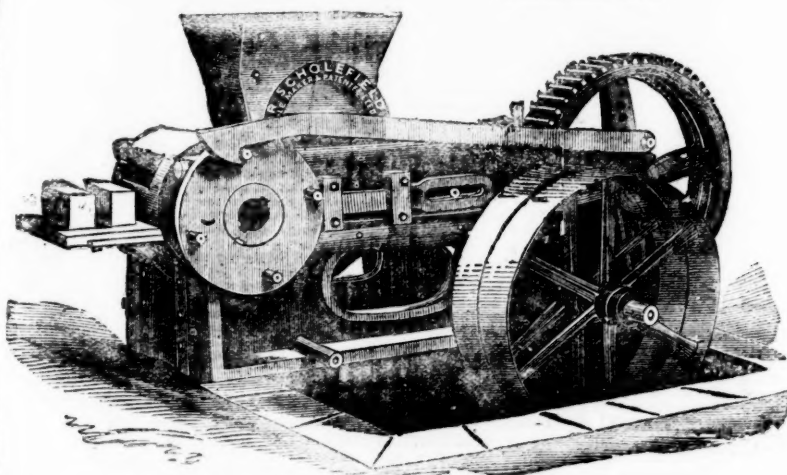
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1 boy greasing, 1s. 6d. per day	0 1 6
1 engine-man, 5s. per day	0 5 0
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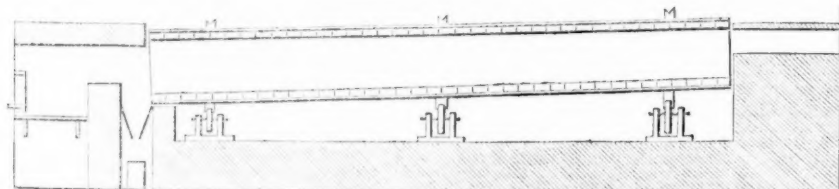
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1000	Admiral Edge, c, Cheshire	10 0 0	—	12 11 8
1000	Balmyngham, c, Wenden (4000 to 10)	1 0 0	—	0 2 0
8000	Bamptide, c, m, Devon	1 0 0	—	0 2 0
400	Botalack, c, St. Just	118 5 0	30	619 15 0
400	Brookwood, c, Buckfastleigh	1 16 0	—	3 16 0
848	Cargill, s, Newlyn	6 2 0	—	4 16 3
840	Cashwell, c, Cumberland	2 10 0	—	1 7 6
100	Carn Brea, c, Illogan	85 0 0	—	0 7 6
1000	Cath. & Jane, c, Penryn	22 9 9	—	11 17 0
2450	Cock's Kitchen, c, Illogan	8 0 0	—	118 10 0
10240	Devon Gr. Consols, c, Tavistock	1 0 0	—	109 19 0
4294	Dolcoath, c, Camborne	10 14 0	—	0 2 0
8500	Drake Walls, c, Calstock	6 0 0	—	0 3 0
15000	Duchess of Westminster, c, Holywell	1 0 0	—	0 3 0
10000	East Baleswiden, c, Sancerre	1 0 0	—	0 3 0
6144	East Caradon, c, St. Cleer	82 0 0	—	14 19 0
800	East Darnley, c, Cardigan	0 9 9	—	14 12 3
6400	East Pool, c, Illogan	6 19 0	—	20 7 6
1936	East Wheel, c, Wenden	6 19 0	—	82 5 0
2800	Foxdale, c, Isle of Man	25 0 0	—	0 11 0
40000	Glasgow Carr, c, [30,000 £1 p., 10,000 15s. p.]	4 0 0	—	0 2 6
15000	Great Dyllife, c, Montgomeryshire	4 0 0	—	19 13 0
15000	Great Laxey, c, Isle of Man	4 0 0	—	8 12 0
15000	Great West Van, c, Cardigan	2 0 0	—	15 16 0
8908	Great Wheel Vor, c, Helston	0 6 0	—	1 12 0
20000	Green Hurth, c, Durham	2 0 0	—	0 5 6
9800	Groegwillyn, c, Cardigan	2 0 0	—	0 10 9
20000	Gunnislake (Clitters), c, c	5 5 0	—	62 5 0
1024	Herdston, c, near Liskeard	8 10 0	—	4 4 0
18000	Hingston Down, c, Calstock	2 5 0	—	4 4 0
25000	Killaloe, c, Tipperary	1 0 0	—	0 3 11 5
400	Lisburne, c, Cardigan	14 15 0	—	52 2 0
14000	Llanidloes, c, Montgomery	3 0 0	—	7 5 0
5120	Lovell, c, Wenden	5 0 0	—	0 17 6
9000	Marka Valley, c, Cardigan	5 0 0	—	0 15 0
11000	Melindur Valley, c, Cardigan	3 0 0	—	0 7 2
9000	Minera Mining Co., c, Wrexham	5 0 0	—	64 15 2
20000	Mining Co. of Ireland, c, c	7 0 0	—	23 11 6
512	North Busy, c, Chacewater	3 9 6	—	0 10 0
12000	North Hendre, c, Wales	2 10 0	—	1 2 6
2000	North Levant, c, St. Just	12 2 0	—	0 4 9
27555	Old Treburget, c, c, (ordinary shares)	1 0 0	—	0 1 4 5
2558	Old Treburget, c, c, (10 per cent. pref.)	3 0 0	—	0 1 4 5
8000	Penhalig, c, St. Agnes	2 0 0	—	0 1 4 5
45793	Penrith, c, c, Gwynedd	2 0 0	—	0 2 8 0
6000	Phoenix, c, c, Llanidloes	4 13 4	—	39 19 0
18000	Prince Patrick, c, c, Holywell	1 0 0	—	0 14 0
1120	Providence, c, Lelant	17 16 7	—	104 12 6
12000	Roman Gravel, c, Balp	7 10 0	—	5 16 0
512	South Caradon, c, St. Cleer	1 5 0	—	15 0 0
6123	South Condurrow, c, c, Camborne	6 5 8	—	4 7 0
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15000	Van, c, Llanidloes	4 5 0	—	17 9 8
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1733	West Dyllife, c, Penrith	10 0 0	—	1 14 0
612	West Tolgus, c, Redruth	25 10 0	—	13 10 0
3042	West Wheel, c, Illogan	27 3 9	—	0 3 0
19363	West Wheel, c, Illogan	3 0 0	—	0 3 0
312	Wheel, c, c, Illogan	11 2 0	—	638 10 0
4295	Wheel, c, c, Illogan	2 13 0	—	8 5 0
4295	Wheel, c, c, Illogan	5 4 8	—	11 19 6
80	Wheel, c, c, Illogan	85 5 0	—	522 10 0
8000	Wheel, c, c, Illogan	2 0 0	—	0 3 0
25000	Wicklow, c, c, Illogan	2 0 0	—	52 9 0
10000	Wye Valley, c, Montgomery	3 0 0	—	0 8 0

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Shares.	Mines.	Paid.	Last Div. Clos. Fr.	Total Div. Per Share. Last Paid
35500	Alamillos, c, Spain	2 0 0	—	1 12 3
80000	Almaden, c, Spain	1 0 0	—	0 6 3
20000	Australian, c, South Australia	7 7 8	—	0 15 0
10000	Battle Mountain, c, c, (2400 part pd.)	5 0 0	—	0 10 0
15000	Birdseye Creek, c, California	4 0 0	—	0 14 0
8000	Bensberg, c, Germany	10 0 0	—	0 14 0
12320	Burra Burra, c, c, Australia	10 0 0	—	70 0 0
20000	Cape Copper Mining, c, c, South Africa	7 0 0	—	23 15 0
40000	Cedar Creek, c, California	5 0 0	—	0 8 0
80000	Central American Association, c, c	0 16 8	—	0 2 0
15000	Chicago, c, Utah	10 0 0	—	0 2 0
21000	Colorado, c, Colorado	5 0 0	—	0 13 0
10000	Copiapu, c, Chile	15 15 0	—	7 8 5
00000	Don Juan, c, del Rey	0 15 0	—	2 9 0
23500	Eberhard & Aurora, c, Nevada	10 0 0	—	12 0 0
80000	Emma, c, c, Utah	20 0 0	—	3 12 0
70000	English and Australian, c, c, Australia	2 10 0	—	2 19 0
10000	Ferguson, c, California	2 0 0	—	0 3 0
20000	Flagstaff, c, Utah	10 0 0	—	4 2 0
20000	Fortuna, c, Spain	2 0 0	—	5 8 10
20000	Gold Run, c, c, Spain	1 0 0	—	0 2 4
85000	Kapunda Mining Co. Australia	1 3 0	—	0 2 4
20000	Last Chance, c, c, Utah	5 0 0	—	14 0 0
10000	Linars, c, Spain	2 0 0	—	0 1 0
65000	London and California, c, c	2 0 0	—	0 1 0
787	Lusitania, Portugal, c, c, (45 shares)	3 10 0	—	0 11 6
5000	Mammoth Copper, c, c, Utah	10 0 0	—	0 8 0
5000	Mountain Chief, c, c, Utah	10 0 0	—	0 4 0
19000	Prussian Mining & Ironworks, c, c	30 0 0	—	6 0 0
10000	Ponteland, c, c, France	20 0 0	—	20 14 2
10000	Port Phillip, c, c, France	1 0 0	—	1 8 0
40000	Richmond Consols, c, Nevada	10 0 0	—	2 14 0
40000	Santa Barbara, c, c, Brazil	0 10 0	—	0 1 2
120000	Scottish Australian Mining Co., c, c	1 0 0	—	15 0 0
80000	Scottish Austral. Mining Co., New	0 5 0	—	15 0 0
112500	Sierra Buttes, c, California	2 0 0	—	1 4 0
80000	South Aurora, c, Nevada	5 0 0	—	0 14 0
225000	St. John del Rey, c, c, (45 stock and multiples dealt in)	540 300	—	1 1 2
15000	Sweetland Creek, c, California	4 0 0	—	3 6 0
40000	Tolima, c, c, (45 sh. pd.)	4 10 0	—	0 11 6
15000	Western Andes, c, c, New Granada	5 0 0	—	2 6 7

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20000	Anglo-Australian, c, Victoria	2 10 0	—	12 11 8
5000	Angulilla Phosphate, West Indies (4000 issued)	10 0 0	—	0 2 0
12000	Argentine, c, Argentina	8 0 0	—	6 4 5
10000	Australian Central, c, c, (also 5000 deferred shares)	10 0 0	—	0 2 0
3000	Bellavista, c, Peru	10 0 0	—	0 2 0
3000	Blue Tent, c, California	5 0 0	—	3 4 5
5000	Braganza, c, Brazil	0 15 0	—	0 15 0
12000	Camp Floyd, c, Utah	10 0 0	—	0 2 0
35000	Cesena Sulphur Company, Romanga, Italy	10 0 0	—	0 2 0
5112	Chontales, c, c, Nicaragua	2 0 0	—	1 4 5
18000	Condes, c, Chile	5 0 0	—	0 2 0
10000	Crescent, c, c, Plumas, California	10 0 0	—	6 4 5
30000	Excelsior Hydraulic Gold Washing Co., California	1 0 0	—	0 2 0
40000	Exchequer, c, c, California	1 0 0	—	17 2 4
5000	Frontino and Bolivia, c, New Granada	2 0 0	—	2 4 5
40000	Holcombe Valley, c, c, California	1 0 0	—	2 4 5
10000	Hornachos, c, c, (210 shares) Spain	10 0 0	—	15 12 14
90000	Imperial Brazilian Collieries, Brazil	5 0 0	—	0 2 0
5000	Jarali, c, c, Nicaragua	1 0 0	—	1 1 4
12000	Lanestosa, c, c, Viscaya, Spain	2 0 0	—	3 4 5
75000	Malabar, c, Colombia	1 15 0	—	0 2 0
40000	Malpaso, c, Colombia	1 0 0	—	0 2 0
12000	Menzenberg, c, c, Honnef, Germany	5 0 0	—	0 2 0
6000	Monte Loretto, c, c, Italy	5 0 0	—	0 2 0
65000	New Quebrada, c, Venezuela	5 0 0	—	3 4 5
80000	New Zealand Kapanza, c, c, Comandante	1 0 0	—	0 2 0
3000	Oregon, c, c, Oregon, U.S. (preference shares)	4 0 0	—	3 4 5
50000	Panulillo, c, Chile	4 0 0	—	4 4 5
80000	Pestarena United, c, Italy	4 0 0	—	2 4 5
50000	Rica, c, Colombia	1 0 0	—	3 4 5
21,131,000	Rio Tinto, c, c, Huelva, Spain	Stock	—	58 56 53
10000	Rosa Grande, c, Brazil	0 19 0	—	1 4 5
80000	Russia Copper, c, c, (10000 pref. shares, fully paid)	1 0 0	—	0 2 0
25000	San Pedro, c, Chile	10 0 0	—	0 2 0
10000	Silver Plume, c, Colorado	2 0 0	—	1 4 5
75000	Snowdrift, c, Colorado	1 0 0	—	0 2 0
80000	Tecoma, c, c, Utah	2 0 0	—	0 2 0
20000	Thornhill Reef, c, Australia	10 0 0	—	3 4 5
43174	United Mexican, c, Mexico	25 15 3	—	3 4 5
14000	Utah, c, c, Utah	5 0 0	—	2 4 5
25000	Victoria, c, c, Australia (25,000 sh. 15s. pd.)	1 0 0	—	0 2 0
75000	Yerke Peninsula, c, South Australia	1 0 0	—	3 4 5
40000	Yerke Peninsula, c, South Australia	1 0 0	—	1 4 5

Have made calls since last dividend was paid.

FOREIGN AND MISCELLANEOUS STOCKS, BONDS, LOANS, AND TRUSTS.

Closing Prices.	Closing Prices.
Argentine, 1865, 6 per cent.	65 97
Bolivia, 6 per cent.	18 29
Brazilian, 1865, 5 per cent.	90 92
Chilian, 1865, 7 per cent.	98 103
City of Providence, 5 p.c. coupon bonds	95 97
Egyptian, 1864, 7 per cent.	28 41
France, 1865, 7 per cent.	29 43
Do., 7 per cent. V.M.L.	29 43
Do., 9 per cent. guar.	29 43
Do., 7 per cent. K.M.L.	37 59
Foreign and Col. Gov. Trust, 5 p.c. 1875	75 75
Do., 5 p.c. 1875, 2d issue	60 70
Do., 6 p.c. 1875, 3d issue	65 70
Do., 1875, 4th issue	65 70
Peruvian, 1870, 6 per cent.	18 19 1/2
Do., 1872, 5 per cent.	13 1/2
Russian, 5 1/2 per cent. L. Mort.	85 85
Spanish, Quicksilver Mort, 5 p.c.	87 80
United States Mort, 6 per cent.	97 1/2

NON-DIVIDEND MINES.

Shares.	Mines.	Paid.	Last Div. Clos. Fr.
10000	Aberdunant, c, Llanidloes	5 0 0	13% 13% 13%
10000	Aberystwyth, c, Cardigan	5 0 0	—
7800	Alvigg & Burg, c, St. Aust. (23 sh.)	1 10 0	—
18000	Amrose Lake, c, c, Liskeard	1 18 6	—
12000	Ashton, c, Carnarvonshire	5 0 0	13% 13% 13%
50000	Ballycummisk, c, Schull	2 0 0	—
13000	Bedford United, c, Tavistock	1 17 6	13% 13% 13%
30000	Belstone, c, Devon (27,000 fully pd.)	1 0 0	2 4 3
13000	Elan United, c, Cardigan	1 0 0	13% 13% 13%
15000	Blue Hills, c, c, St. Agnes	2 0 0	—
2000	Bowden Hill, c, m	1 0 0	—
20000	Brynabor, c, Cardigan	1 0 0	—
493	Bwadrain, c, Cardigan	4 0 0	—
4127	Bwlch Consols, c, Cardigan	5 0 0	—
30000	Calbeck Fells, c, Cumberland	2 0 0	—
5584	Carn Camborne, c, c, Camborne	5 3 6	3% 3% 3%
10000	Cathedral, c, c, Gwynedd	1 10 0	13% 13% 13%
20000	Central Foxdale, c, Isle of Man (22 sh.)	1 0 0	—
10000	Central Van, c, c, Llanidloes	8 0 0	—
20000	Cwm Dwyfor, c, c, Carnarvonshire	1 0 0	—
13000	Cwm Nant Dd, c, c, Montgomery	4 0 0	—
3000	Cwmystwith (New Consols), c, c	3 0 0	—
10000	Denbighshire Consolidated, c, c	3 0 0	3 2 4 3
558	Ding Dong, c, Gulval	50 14 6	4 5 4
10000	Dubby Syke, c, Durham	5 0 0	3% 3% 3%
18000	Duchy Great Consols, c, Calstock	5 0 0	—
512	East Basset, c, Redruth	77 7 6	2 4 3
800	East Black Craig, c, Scotland	25 0 0	—
8000	East Brompton, c, c, Penrith	6 12 0	2 4 3
4000	East Grevelly, c, c, Camborne	7 8 6	2 4 3
30000	E. Nant-y-mwyn, c, c, Brecknockshire	1 0 0	3 4 3
6000	East Tywarthall, c, St. Agnes	0 10 0	3 4 3
15000	East Van, c, Llanidloes	5 0 0	10 4 9
20000	Elgar, c, c, Cardigan	1 0 0	1 4 1
12800	Florence and Tonkin United, c, c	0 10 0	—
5000	Frank Mills, c, Christow	5 0 0	5 4 5
8000	Fronvelan, c, c, [4000 sh. fy. pd.]	1 0 0	—
3550	Gawton, c, Tavistock	4 6 0	5 4 5
12000	Glan Clwyd, c, c, Gwynedd	1 0 0	7 4 3
10000	Glan Severn, c, c, Flintshire	1 0 0	—
2000	Glenroy, c, c, Isle of Man	4 0 0	7 4 3
10000	Glyn, c, c, Llanidloes	2 0 0	3 4 3
15000	Gobbett, c, Dartmoor	2 10 0	—
12000	Goginan, and Level Newydd, Card.	1 0 0	—
10000	Gors, c, Merionethshire	1 0 0	—
2000	Gornal, c, Carnarvonshire	1 0 0	—
7500	Gould and Merlyn Cons. Flint	2 10 0	3 2 4 3
20000	Gt. East Foxdale, c, I. of Man (11 sh.)	0 15 0	—
10000	Great Pant-y-Pydwel, c, Holywell	2 0 0	—
15000	Grosvenor, c, Holywell (21 sh.)	0 7 0	—
10000	Harehope Gill, c, Durham (21 sh.)	0 3 6	—
814	Harwood, c, c, Llanidloes	0 15 0	1 4 1
8000	keswick United, c, c	5 0 0	—
8000	Killifreth, c, Chacewater	1 8 0	3% 3% 3%
25000	Kingston Consols, c, Cornwall	1 0 0	3% 3% 3%
12000	Ladywell, c, c, Salop	2 10 0	1 4 1
2500	Levant, c, c, St. Aust.	9 6 6	—
64	Llanidlo, c, c, Flintshire	60 0 0	—
15000	Llanilivory Cons., c, c, ars, Llanilivory	1 0 0	1 4 1
10000	Llanlilar, c, Montgomery (22 sh.)	1 10 0	—
30000	Llanidloes, c, c, Llanidloes	1 0 0	8 4 3
15000	Llwyn Teifi, c, c, Cardigan	1 0 0	2 4 3
8000	Medina Moor, c, Wendron	1 4 0	1 4 1
10000	Melland Copper, Hayle	2 0 0	—
13000	Monydd Gorda, c, Cardigan	0 9 0	4 5 4
4000	Nanty, c, Montgomeryshire	1 0 0	—
15000	Nant-y-Ronen, c, Cardigan	1 0 0	—
10000	Neptune, c, c, St. Agnes	0 5 0	—
10000	New Brompton, c, c, Penrith	7 8 6	—
3000	New Chives, c, c, Northumberland	6 0 0	6 4 3
20000	New Consols, c, Tavistock	3 0 0	1 4 1
8000	New Crickheath, c, c, Shropshire	2 0 0	—
8000	New Dolcoath, c, c, Camborne	3 0 0	1 4 1
20000	New East Foxdale, c, c, Isle of Man	0 15 0	—
18000	New Fowey Consols, c, St. Blaize	3 0 0	2 4 3
2 00	New Hendra, c, Breage	2 9 0	1 4 1
10000	New North Pool, c, c, Illogan	3 0 0	—
4000	New Penryn, c, c, c, Par Station	5 3 6	3 4 3
5000	New Rosewarne, c, c, G. Inear	0 10 0	3 4 3
3200	New South Merilly, c, c, Flint	2 10 0	—
4 00	North Cornwall, c, Cornwall (25 sh.)	3 0 0	3 4 3
17000	North Lacey, c, c, Isle of Man	2 0 0	1 4 1
20000	North Prince Patrick, c, c, Holywell	1 0 0	1 4 1
2000	North Wheel Town, c, c, Illogan	1 19 6	—
1000	North Rosewarne, c, c, Gwinear	6 12 6	—
8000	North Treleigh Wood, c, Redruth	1 0 0	1 4 1
8598	North Treskerby, c, St. Agnes	3 15 4	—
5000	Old Talgach, c, Flintshire	2 0 0	—
5000	Old Tincroft, c, c, Lelant	4 0 0	4 5 4
18923	Parys Mountain, c, c, Anglesea	3 0 0	3 4 3
4000	Patey Bridge, c, c, Yorkshire	5 0 0	4 5 4
5530	Pelra-nant, c, c, Redruth	9 17 0	—
5000	Pennant, c, c, North Wales	5 0 0	5 4 5
12000	Penrhy, c, c, Shropshire	2 0 0	2 4 3
12000	Plympton, c, c, Llanidloes	2 0 0	3 4 3
648	Polrose, c, Breage	21 0 0	—
10000	Port Nizel, c, c, Carnarvonshire	2 0 0	2 4 3
2000	Prideaux Wood, c, Llanvory	5 0 0	—
12800	Prince of Wales, c, Calstock	1 9 0	3 4 3
6000	Relation Consols, c, c, Gwinear	0 10 0	3 4 3
15000	Rookhope, c, c, Durham	1 0 0	1 4 1
5869	Rosewall Hill and Ransom, c, c	4 17 6	3 4 3
8000	Rosewarne United, c, c, Gwinear	0 10 0	—
3000	Russell, c, c, Swymbridge	0 6 0	—
5000	Silvercross, c, c, Marazion	1 0 0	1 4 1
12000	Snowbrook, c, c, Montgomery	5 0 0	5 4 5
12000	South Bwadrain, c, c, Llanbadarnfawr	0 10 0	—
649	South Carn Brea, c, c, Illogan	2 17 0	1 4 1
10000	South Cwmystwith, c, c, Cardigan	0 10 0	3 4 3
4000	South Darnall, c, Cardigan	1 0 0	—
512	South Dolcoath, c, c, Redruth	12 5 0	1 4 1
12000	South Lisbarn, c, c, Cardigan	0 12 6	—
18000	South Roman Gravel, c, c	1 10 0	1 4 1
8000	South Roskear, c, c, Camborne	6 10 0	5 4 5
8000	South Tolarne, c, c, Camborne	1 9 0	3 4 3
12000	South Van, c, c, Montgomeryshire	1 0 0	—
3000	South Ward, c, c, Beerterris	5 8 0	1 4 1
3800	South Wh. Frofty, c, c, Illogan	36 0 0	15 4 3
4500	South Wh. Frances, c, c, Illogan	46 17 9	1 4 1
432	Spearn Moor, c, Penzance	46 17 9	—
14000	St. Blaize, c, c, (22 10s. sh.)	2 0 0	—
4000	St. Lawrence, Amal, c, c, Flintshire	2 0 0	—
12 0	St. Harmon, c, c, Montgomery	3 0 0	3 4 3
10000	St. Patrick, c, c, Halkin, Holywell	1 0 0	1 4 1
8000	Success, c, c, c, (12,000. called).	1 0 0	—
18000	Sunnyside, c, c, Durham	2 0 0	3 4 3
30000	Talybont, c, c, Talylont	1 0 0	3 4 3
4000	Teedale, c, c, Durham	0 18 0	2 4 3
14000	Teign Valley, c, c, Bridford	1 0 0	—
10000	Teign, c, c, Cardigan	1 0 0	—
12000	Treigh, c, c, c, St. Ives	0 3 0	3 4 3
5000	Treigh Wood, c, Redruth	5 0 0	—
547	Trelyon Consols	15 0 0	3 4 3
12000	Trehellan, c, c, Crantock	2 0 0	—
4000	Trumpet Consols, c, Helston	9 0 0	—
5174	Unity Wood, c, c, Kenwyn	3 18 0	1 4 1
20000	Van Consols, c, Llanidloes	2 10 0	2 4 3
1000	Vaughan, c, c, Cardigan	10 0 0	—
12000	West Ashton, c, c, Carnarvon	1 0 0	2 4 3
6000	West Basset, c, c, Illogan	5 6 0	5 4 5
20000	West Bryn Ceinny, c, c, Flintshire	1 0 0	—
3000	West Craven Moor, c, c, Pateley Bridge	10 0 0	11 4 3
12000	West Esgrail Lie, c, Card.	2 0 0	3 4 3
5000	West Godolphin, c, c, Breage	1 13 6	1 4 1
12000	West Goginan, c, c, Cardigan	2 0 0	2 4 3
15000	West Great Work, c, Breage	1 0 0	1 4 1
10000	West Llangynog, c, c, Montgomery	1 0 0	—
12000	West Ma. Amal, c, c, c, Lamer	4 12 6	3 4 3
3000	West Mary Ann, c, c, Menheniot	1 0 0	3 4 3
50000	West Mill, c, c, Flint	0 10 0	—
12000	West Pant-y-Go, c, c, Flint	1 0 0	—
4000	West Pateley Bridge, c, c, Yorkshire	5 0 0	5 4 5
8000	West Phenix, c, c, Linkinhorne	0 18 0	—
1403	West Phreben, c, c, St. Agnes	3 8 0	—
10000	West Roskear, c, c, c, Camborne	0 12 0	3 4 3
12000	West Tack, c, c, c, Salop	3 0 0	2 4 3
4000	West Wh. Gorland, c, c	0 10 0	—
2000	West Wheel Pevor, c, Redruth	0 10 0	—
8000	West Wheel Seton, c, c, Camborne	4 0 0	3 4 3
6000	Wheel Agar, c, c, Illogan	11 10 0	2 4 3
8000	Wheel Argus, c, c, Saneared	0 10 0	—
2500	Wheel Arthur, c, c, Calstock	1 0 0	—
741	Wheel Basset and Gylis, c, c	9 18 6	—
8000	Wheel Coates, c, c, St. Agnes	2 0 0	—
8000	Wheel Goginan, c, c, Tavistock	4 1 0	2 4 3
8400	Wheel Emmo, c, c, c, Llanidloes	1 0 0	—
5179	Wheel Grenville, c, c, Camborne	11 11 6	1 4 1
1 503	Wh. Mary Hatching, c, c, c, Plympton	14 0 0	—
30 0	Wheel Pevor, c, c, Redruth	6 1 0	2 4 3
4000	Wheel Uny, c, c, Redruth	13 3 0	1 4 1